



www.heartroid.com



HEARTROID®

Cardiac Catheterization Simulator



Do practice not on a patient but ...

“HEARTROID”

“HEARTROID” is a catheterization simulator offering procedural trainig opportunities for physicians and medical students.



Imaging-compatible

Practical training under X-ray fluoroscopy and echocardiography



Easy-to-setup

Ready-to-use in just a few minutes without any technical knowledge



Portable

Inflight carry-on baggage compatible



Any situation

In the cath lab, office, conference hands-on and anywhere

HEARTROID®PROJECT

HEARTROID®

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HEARTROID System



Just pour water and connect with the Pump

“HEARTROID” is a training system with a model and a pulsatile pump for physicians and medical students. This system offers realistic clinical images under multiple imaging modalities in the clinical scene, with a short prep time.

How to Set UP

Reading QR code, you can find the movie “How to set up”.



Coronary



TAVI



Components

Model

3D-printed models to practice cardiovascular, electrophysiological and neurovascular procedures. Can be customized up to request.



Smart Tank

Transparent tank that provides high visibility and usability for simulation training using camera and imaging modalities like X-ray fluoroscopy, echocardiography and EP mapping systems.



Pulsatile Pump



Our uniquely-developed pulsatile pump can be set by 30-120 bpm (1200-4800ml/min in flow volume). Realistic clinical images are obtained by particular patterns of the cylinder movement.

Hose



Hose with one-touch joint.

Sheath



Special tubes with sheath.

Lubricant

Special lubricant for coating the inner surface of models. 1 fl. oz. (lasts for 20 coatings)



Camera Set

A compact camera with a flexible arm that can provide clear images from various angles.



Carry Case

Capable of containing the components and special table.



CORONARY

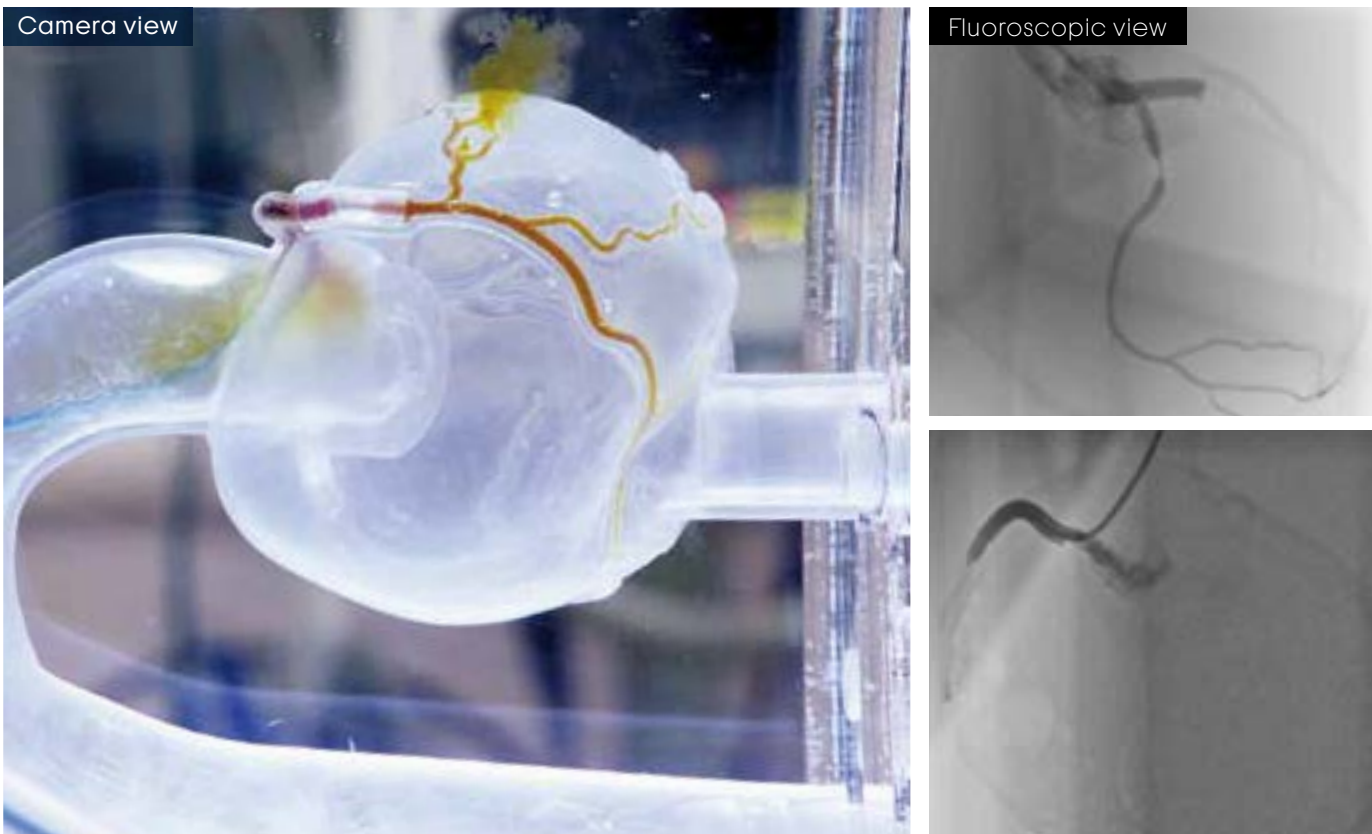
HEARTROID coronary series can facilitate many scenario-based trainings for interventional cardiologists from simple CAG, PCI, Atherectomy, ACS, to advanced CTO, Bifurcation strategy and some bail-out procedures under the realistic angiographic images produced by camera and X-ray fluoroscopy in the cath lab.

Coronary Model



PCI Model

Compatible Procedure						
CAG	CABG	ACS	IVUS/OCT	FFR	Stent	Atherectomy
IVL	DCA	Bifurcation	CTO	Rupture	Coiling	



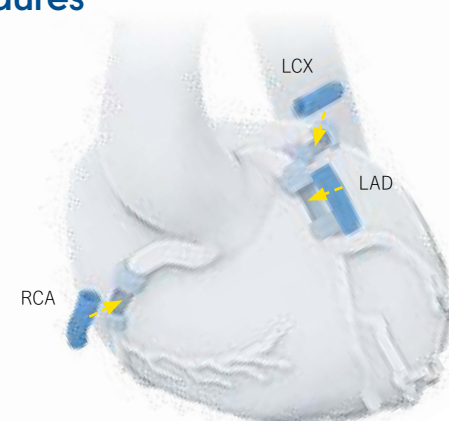
This model allows trainees to understand the strategy behind dealing with various lesions, especially severe calcification. With calcified vessel parts, one can practice the debulking technique with Directional Coronary Atherectomy (DCA) devices.

Replaceable “Lesion parts” according to the procedures

HEARTROID Coronary series have sockets for attaching “Lesion parts”(except for CAG model). You can perform various training by replacing the “Lesion parts” according to the purpose.



See p.II in details ►



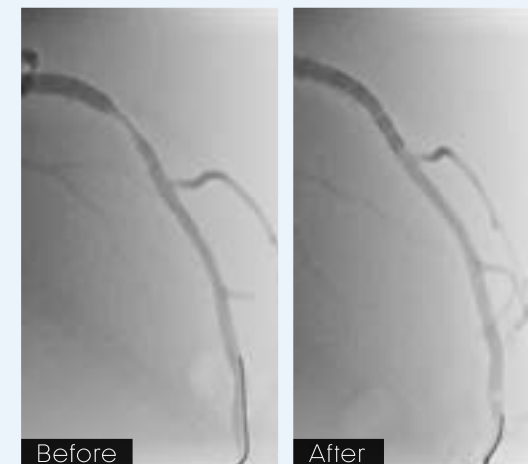
Easy to set up



Recommended procedures

Stenting (Simple PCI procedure)

With “Soft Plaque” parts ► See p.II



This scenario shows a simple PCI; that is balloon dilatation followed by stent deployment. Imaging catheters (IVUS, OCT, Angioscopy) and FFR are also applicable. Training under X-ray fluoroscopy is more beneficial.

Atherectomy (Debulking procedures)

With “Calc” parts ► See p.II



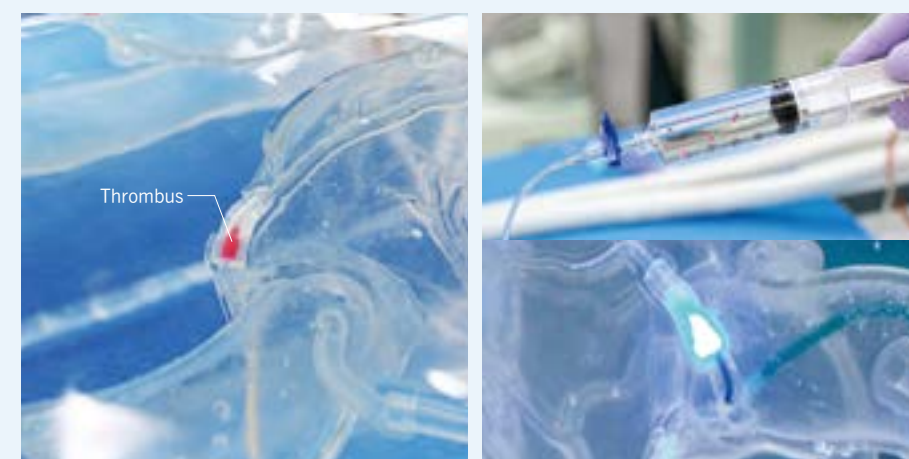
This scenario allows trainees to understand the strategy behind dealing with various lesions, especially severe calcification. With calcified vessel parts, one can practice the debulking technique with Rotablator and Directional Coronary Atherectomy (DCA) devices. Training under X-ray fluoroscopy is more beneficial.



Rotablation with HEARTROID

ACS(Thrombectomy, balloon and stenting, Laser ablation)

With “ACS” parts ► See p.II

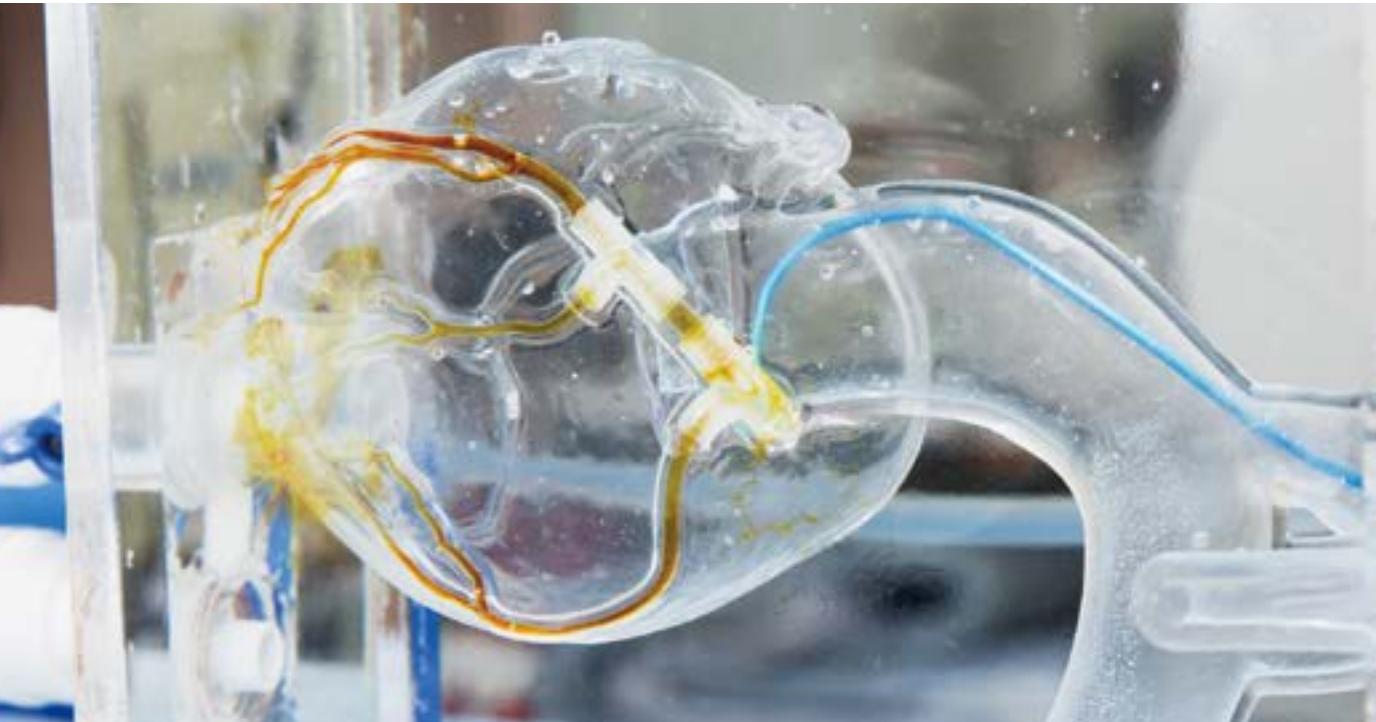


This scenario facilitates emergent PCI strategy including laser ablation and/or thrombectomy followed by balloon dilatation and stent deployment. In successful case, you can see some thrombus in a syringe along with a nice final angiography.

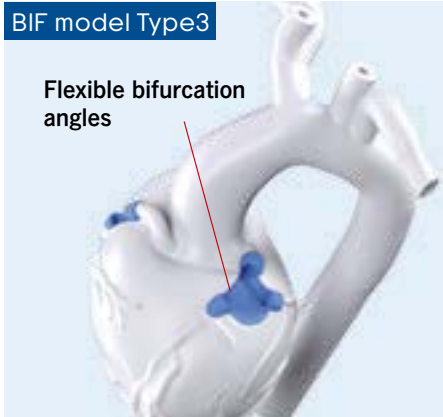
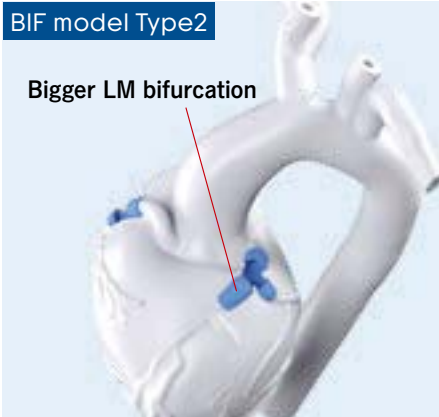
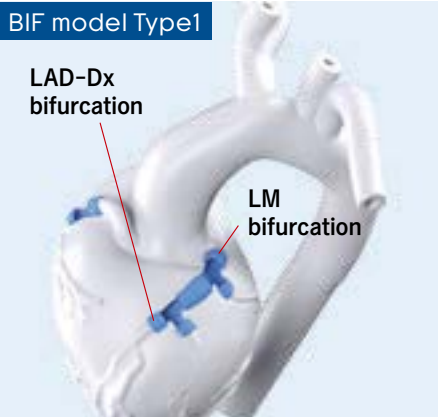
BIF Model

Compatible Procedure

CAG	CABG	ACS	IVUS/OCT	FFR	Stent	Atherectomy
IVL	DCA	Bifurcation	CTO	Rupture	Coiling	

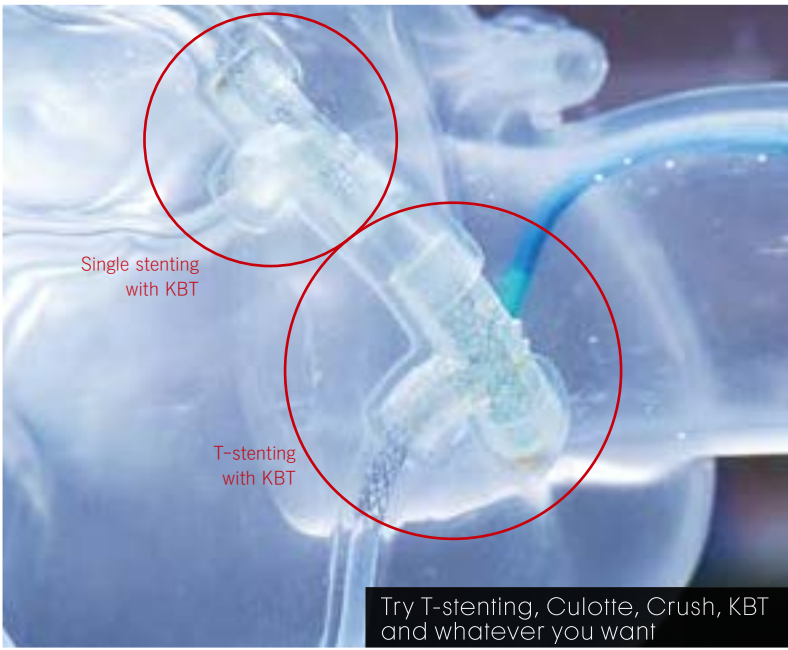
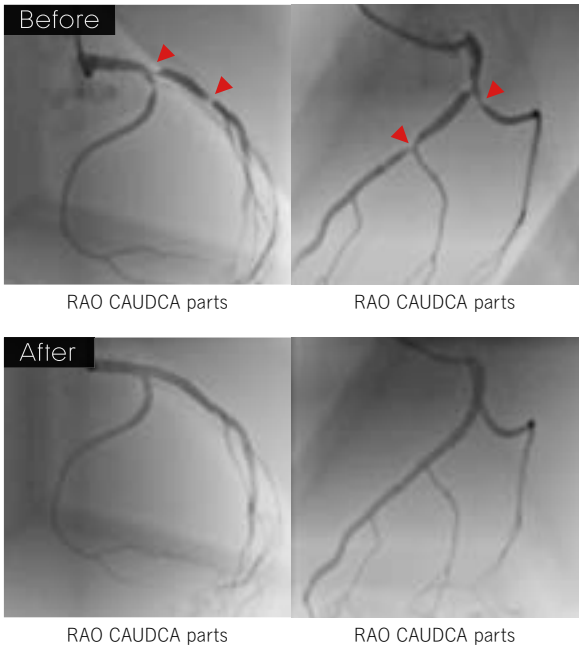
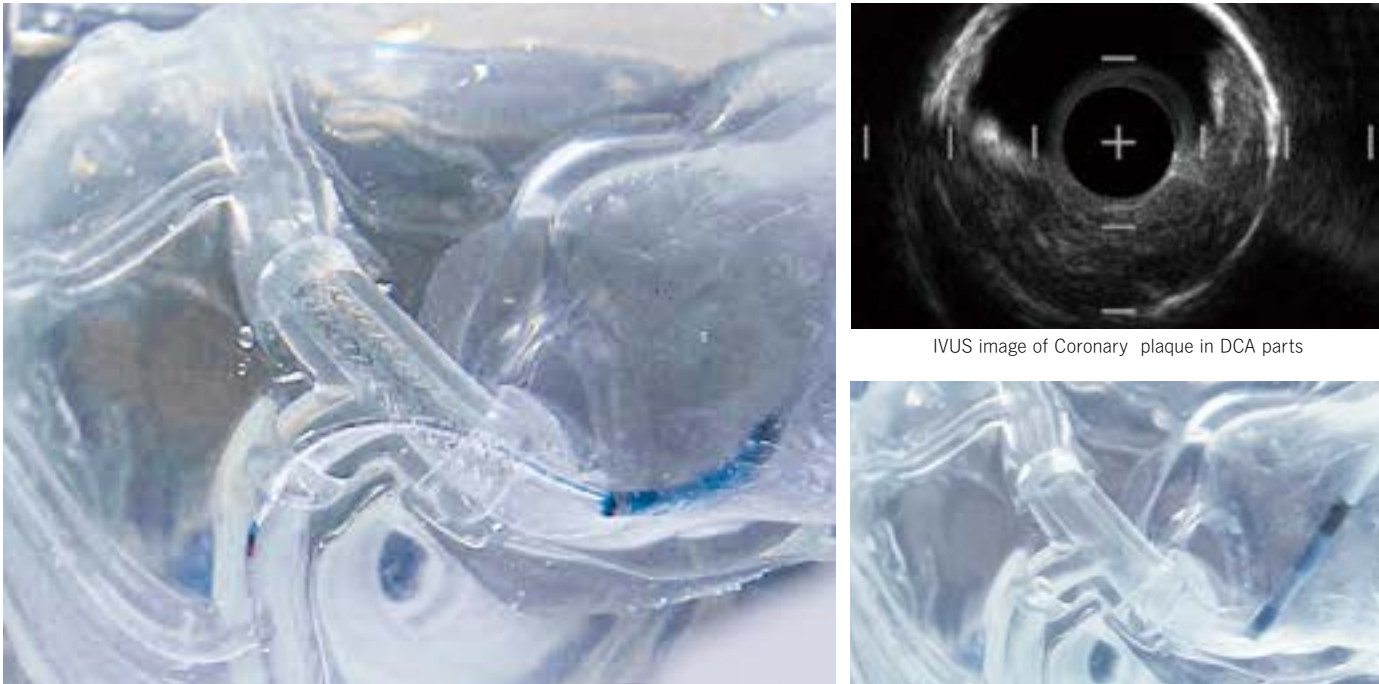
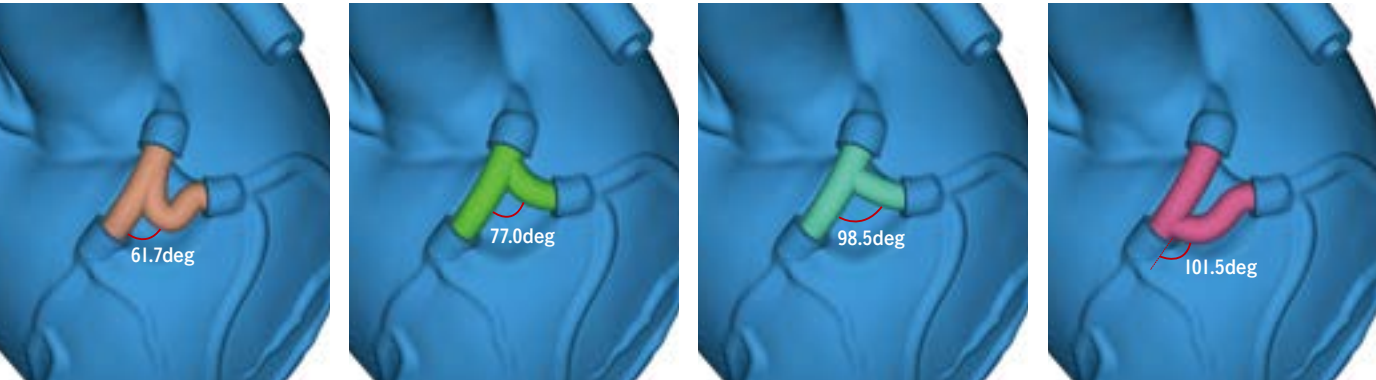


BIF model can facilitates the full procedures around LM (left main) bifurcation and LAD-Dx (diagonal branch) bifurcation strategies. Let's try T-stenting, Culotte, Crush, KBT and whatever you want!



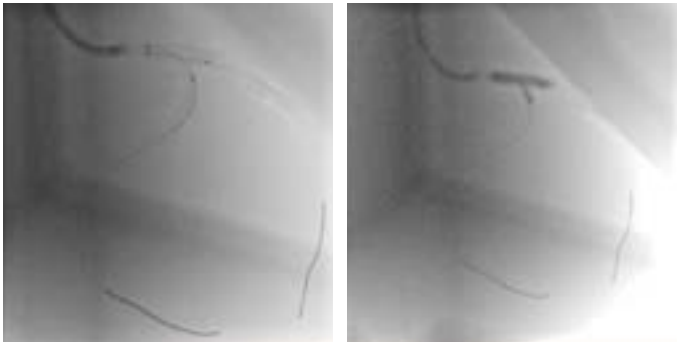
See the pictures below ▼

Flexibility in bifurcation angles

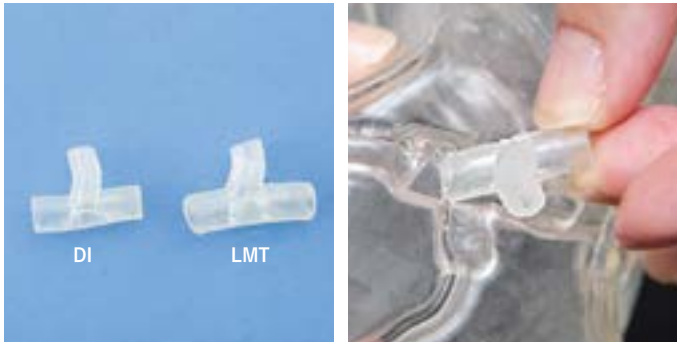


KBT (Kissing balloon technique)

KBT & POT with HEARTROID



BIF lesion parts (detachable & disposable)

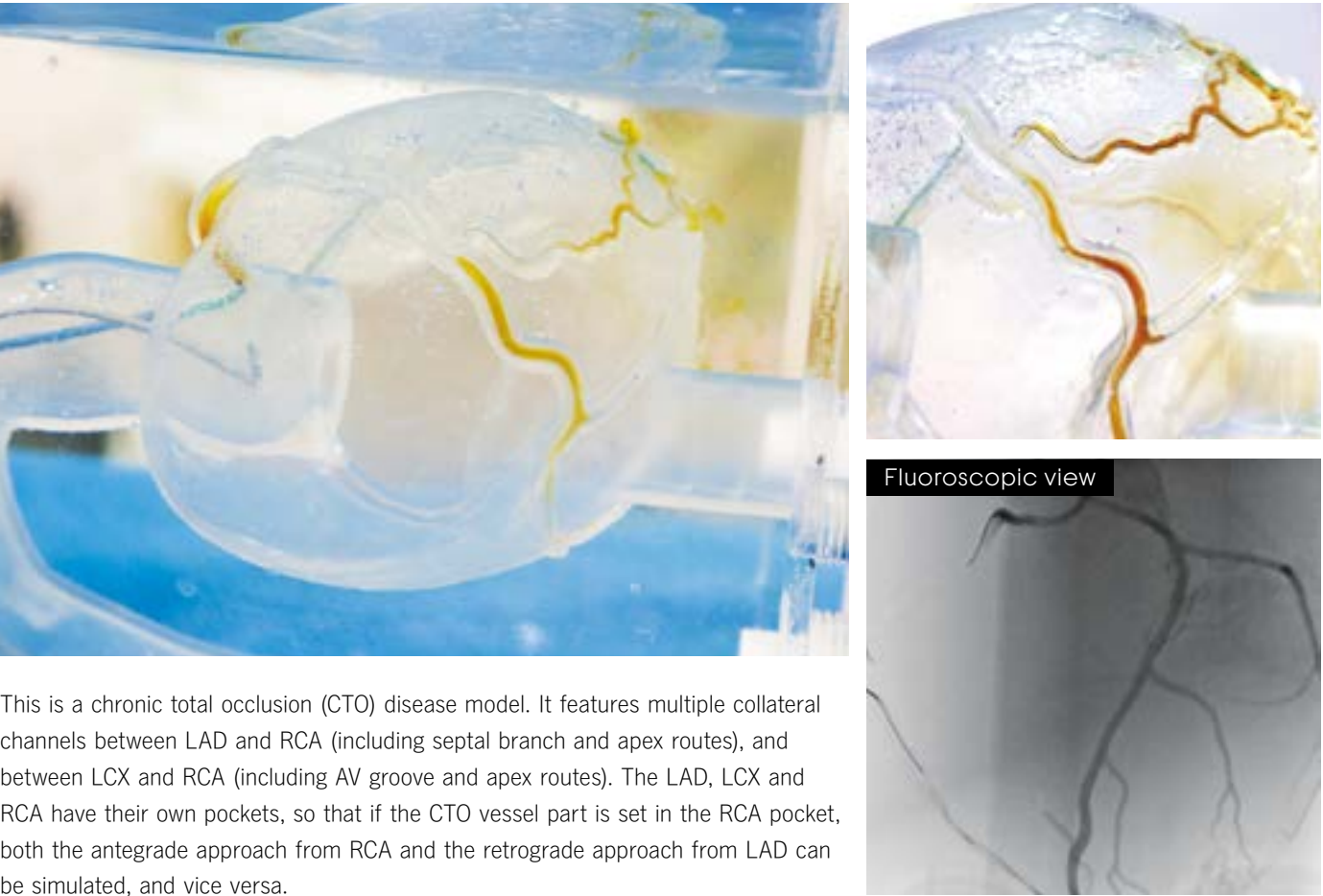


CTO Model

Compatible Procedure

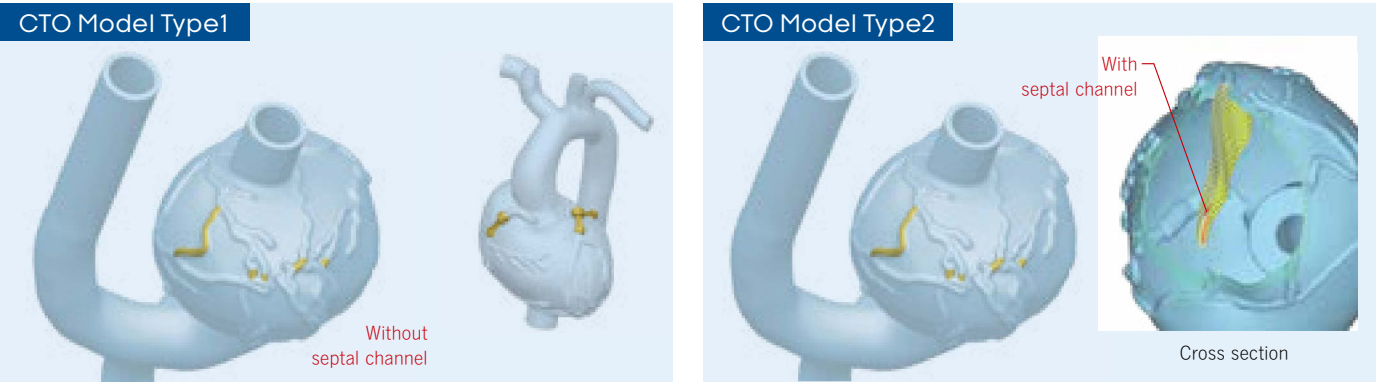
CAG	CABG	ACS	IVUS/OCT	FFR	Stent	Atherectomy
IVL	DCA	Bifurcation	CTO	Rupture	Coiling	


Web



This is a chronic total occlusion (CTO) disease model. It features multiple collateral channels between LAD and RCA (including septal branch and apex routes), and between LCX and RCA (including AV groove and apex routes). The LAD, LCX and RCA have their own pockets, so that if the CTO vessel part is set in the RCA pocket, both the antegrade approach from RCA and the retrograde approach from LAD can be simulated, and vice versa.

CTO Model lineup



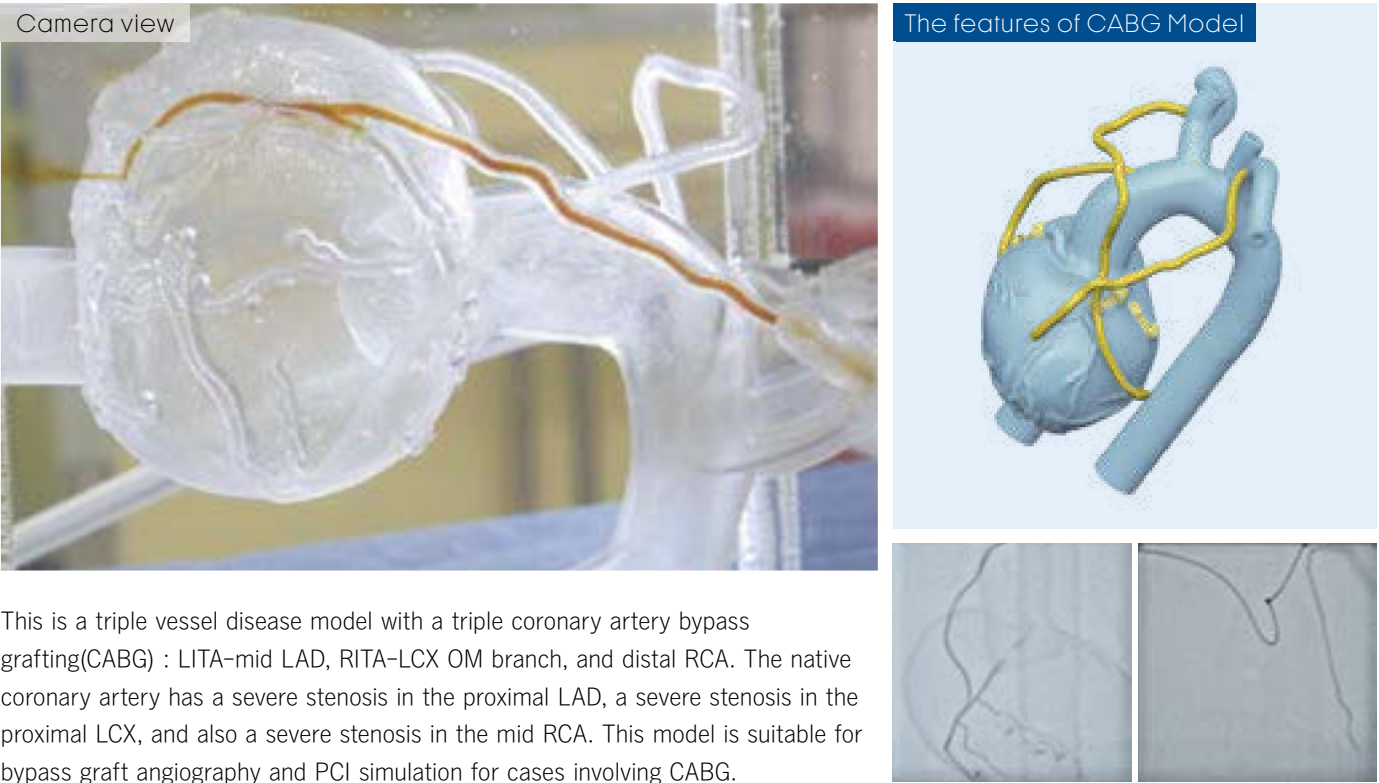
The standard model includes one lesion proximal to each of LAD, LCX and RCA. For the collateral vessels, the apex and AV groove routes are available for Type 1, and the septal branch route for Type 2. By changing the position of the detachable coronary artery parts, the occluded vessel can be selected. For example, when CTO lesion part can be placed proximal to RCA, then an antegrade approach can be attempted from RCA side, followed by a retrograde approach from LAD side and vice versa.

CABG Model

Compatible Procedure

CAG	CABG	ACS	IVUS/OCT	FFR	Stent	Atherectomy
IVL	DCA	Bifurcation	CTO	Rupture	Coiling	


Web



This is a triple vessel disease model with a triple coronary artery bypass grafting(CABG) : LITA-mid LAD, RITA-LCX OM branch, and distal RCA. The native coronary artery has a severe stenosis in the proximal LAD, a severe stenosis in the proximal LCX, and also a severe stenosis in the mid RCA. This model is suitable for bypass graft angiography and PCI simulation for cases involving CABG.

CAG Model

Compatible Procedure

CAG	CABG	ACS	IVUS/OCT	FFR	Stent	Atherectomy
IVL	DCA	Bifurcation	CTO	Rupture	Coiling	


Web



This system facilitates full procedures necessary in CAG (coronary angiography). It allows trainees to understand how to manipulate catheters, guidewires and contrast injection under camera and X-ray fluoroscopic view. Both transfemoral and transradial approach compatible. This entry model is suitable for young cardiologists, medical students and cath lab staffs' team simulation.

Lesion parts (Detachable & Disposable)

The lesion parts are easy to change, for a quick reset.

Normal



75% stenosis with soft plaque suitable for direct stenting

Soft plaque



75% stenosis with soft plaque suitable for direct stenting

ACS



100% total occlusion easy to pass

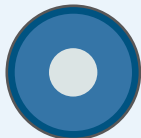
CTO

Only for CTO model



100% total occlusion. (Hardness: level 1 to 5)

Concentric Calc



75% stenosis with concentric calcification suitable for Atherectomy (1.0mm, 1.25mm, 1.5mm, 1.75mm)

Eccentric Calc



75% stenosis with eccentric calcification suitable for Atherectomy (1.0mm, 1.25mm, 1.5mm, 1.75mm)

IVL



75% stenosis with concentric calcification suitable for IVL

Rupture



For bail-out scenario "Coronary Rupture"

Normal BIF



Suitable for stenting under camera view

BIF soft plaque



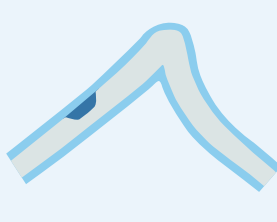
Suitable for stenting under X-ray

BIF calcification



Calcified lesion for both camera and X-ray

DCA



IVUS-visible soft plaque suitable for DCA



Easy to set up

Stenosis



Concentric Calc



IVL



CTO



Compatible procedures

Model	CAG	PCI	CABG	CTO	BIF
Coronary angiography (CAG)	☐	☐	☐	☐	☐
PCI/CAG for CABG			☐		
Thrombectomy / ELCA for ACS		☐	☐	☐	
IVUS / OCT imaging		☐	☐	☐	☐
Fractal Flow Reserve (FFR)		☐	☐	☐	☐
Stent deployment		☐	☐	☐	☐
Atherectomy (Rotablation/OA)		☐	☐	☐	☐
Intravascular Lithotripsy (IVL)		☐	☐	☐	☐
Directional coronary atherectomy (DCA)					☐
Bifurcation procedure KBT/Culotte & Crush stenting					☐
Chronic total occlusion (CTO)				☐	
Coronary rupture (covered stent)		☐	☐	☐	☐
Coiling for coronary perforation	☐	☐	☐	☐	☐

* for RCA only



Recommended Bail-out procedures

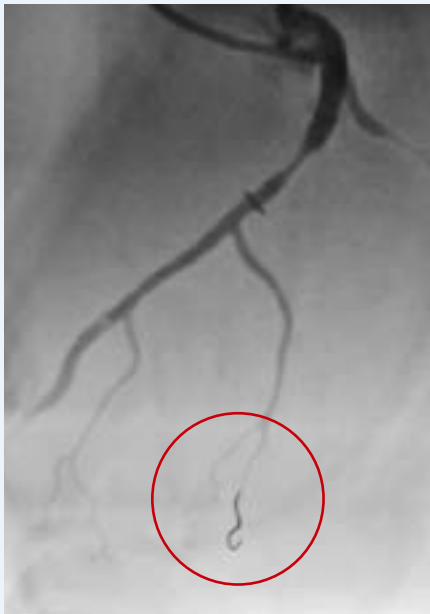
Coiling for coronary perforation



Coronary perforation



Coiling procedure

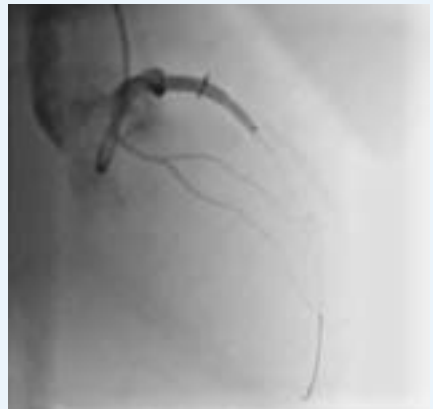


Successful coiling

Ping-pong technique for coronary rupture



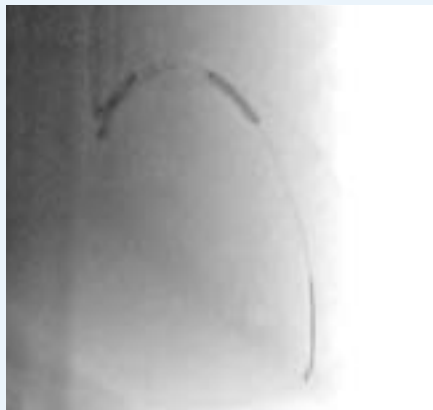
Coronary rupture



Balloon occlusion



Double guide catheter



Ping-pong technique



Covered stent



Successful stenting

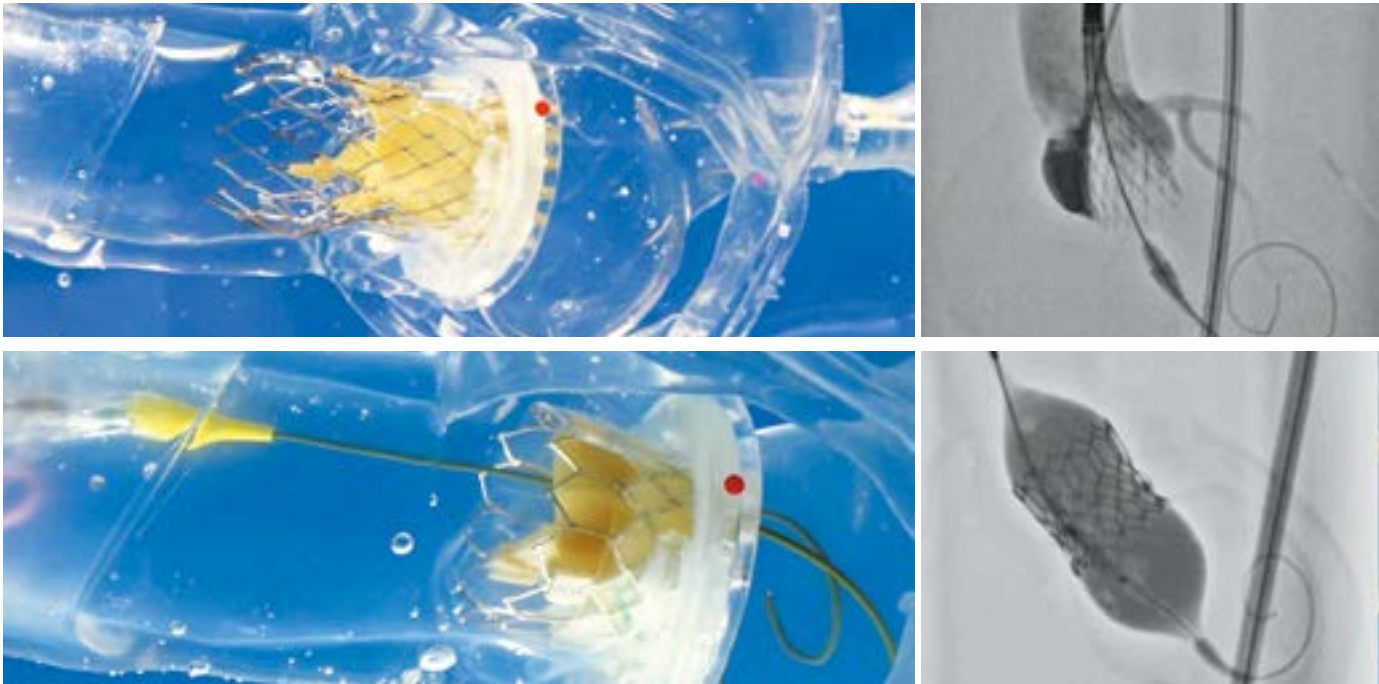
STRUCTURE

HEARTROID Structure series cover catheterization procedures for four valves: Aortic, Pulmonary, Mitral, Tricuspid as well as plug-closures for LAA, ASD and PFO under X-ray and echocardiographic imaging. ASD/PFO model is also capable of Transeptal puncturing process.

Structure Model

				
TAVI Model	CEP Dry Model	MV Model	TV Model	TPVI Model
				
LAA Model	TSP Model	ASD/PFO Model	CSR Model	

TAVI Model



HEARTROID TAVI model facilitates technical training for TAVI (Transcatheter Aortic Valve Implantation), a novel therapy for aortic valve stenosis. With a pulsatile pump included in the set, stent valve deployment under blood flow can be verified by simultaneous aortography. This system is appropriate for both balloon-expandable and self-expandable transcatheter stent valves. It is also applicable to both the TF and TA approach. It can be used under various circumstances, from hands-on seminars at an exhibition booth to simulation under X-ray fluoroscopy in the cath lab. The detachable aortic valve part enables quick preparation and effective training.

Valve Implantation

* Recommended angles when using TAVI model 37° .

Cusp Overlap
Technique with
HEARTROID



LAO Technique

LAO View LAO17 CAUI0

Cusp Overlap Technique

Native Coplanar View AP CAUI0

Cusp Overlap View RAO25 CAUI5

LAO View LAO17 CAUI0

Components

Heart Model for TAVI

Heart model suitable for practical training in TAVI under X-ray fluoroscopy in the cath lab.

Valve parts

One of the valves shown below is included.

Smart Tank for TAVI

HEARTROID Pump Type-2

Camera Set

Carry Case

Coronary Height Variety

Normal Position

RCA 20mm LCA 14mm (Type1)

20mm

14mm

Lower Position

RCA 10mm LCA 8mm (Type2)

10mm

8mm

Valve Parts Type (Detachable and Switchable)

Aortic Stenosis Valve

LAO View LAO17 CAUI0

Bicuspid Aortic Valve

LAO View LAO17 CAUI0

Aortic Regurgitation Valve

LAO View LAO17 CAUI0

Valve Parts Size (Aortic annulus)

* Φ19 mm module is compatible only with the type 2 design of the heart body module

Aortic Annulus	19 mm	22 mm	25 mm	28 mm
Heart body	Type M			Type L

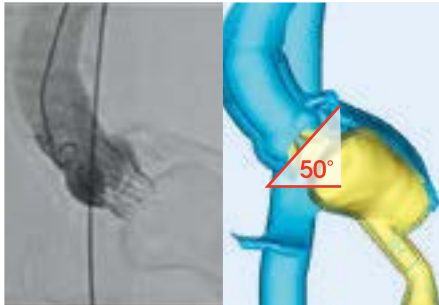
Aortic Angle variety

TAVI Model 37°



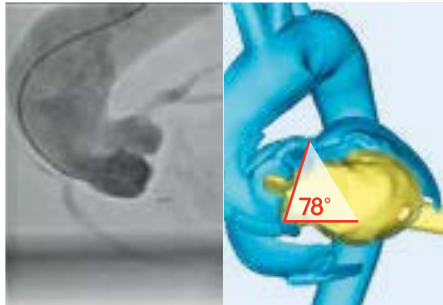
* Recommended angles
Coplanar view : AP CAU10
Cusp Overlap View : RAO25 CAU15

TAVI Model 50°



* Recommended angles
Coplanar view : AP CAU10
Cusp Overlap View : RAO13 CAU26

TAVI Model 78° (Horizontal Aorta Model)

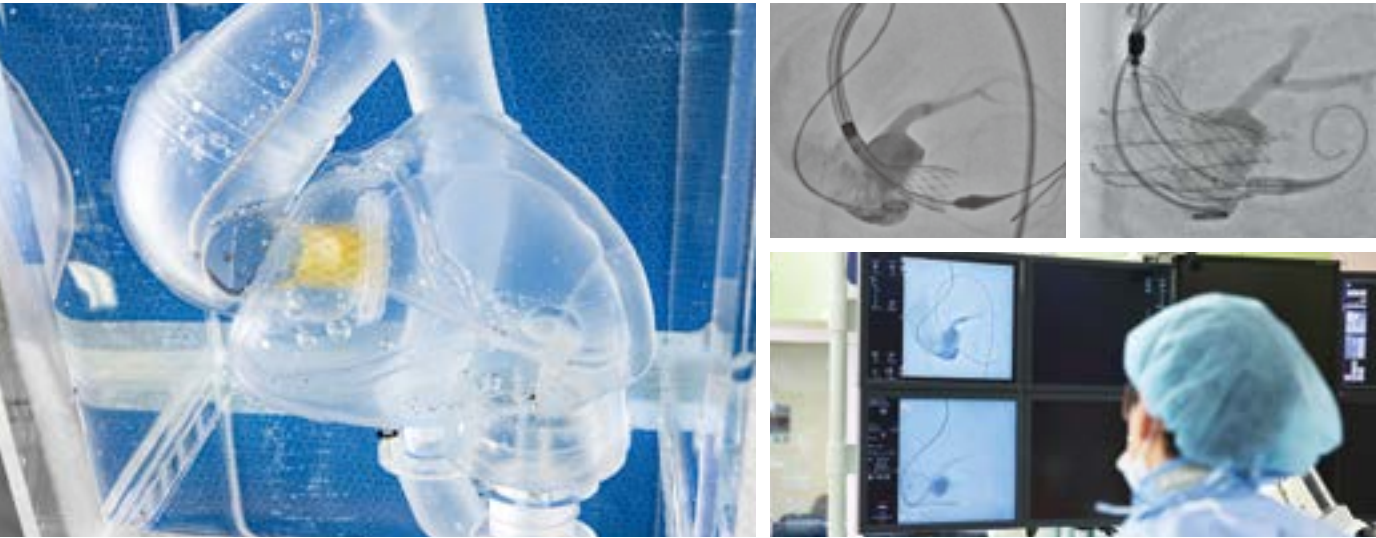


* Recommended angles
Coplanar view : LAO9 CAU19
Cusp Overlap View : RAO7 CAU44

TAVI Model Compatibility

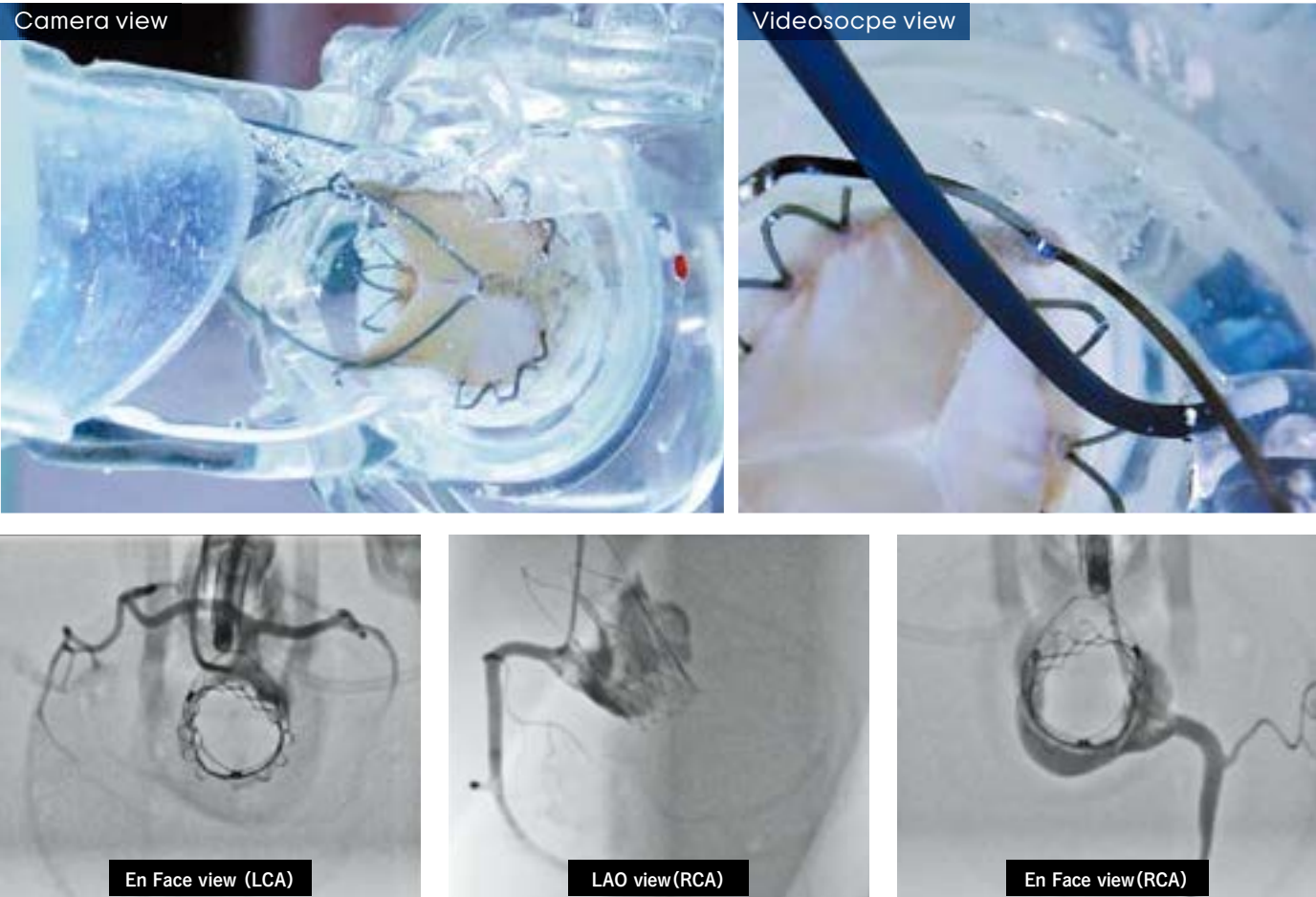
Aortic Angle	37°		50°		78°
Heart model	Type M		Type M	Type L	Type HZ
Tank	37° tank		50° tank		HZ tank
Pump	Type-2				
Valve parts	19 / 22 / 25 mm		19 / 22 / 25 mm	28 mm	25 mm
	AS / Bicuspid / AR		AS / Bicuspid / AR		AS / Bicuspid
videoscope	○		○		—
Alternative Access	—		○		—
CEP	—		○		—

TAVI Horizontal Model



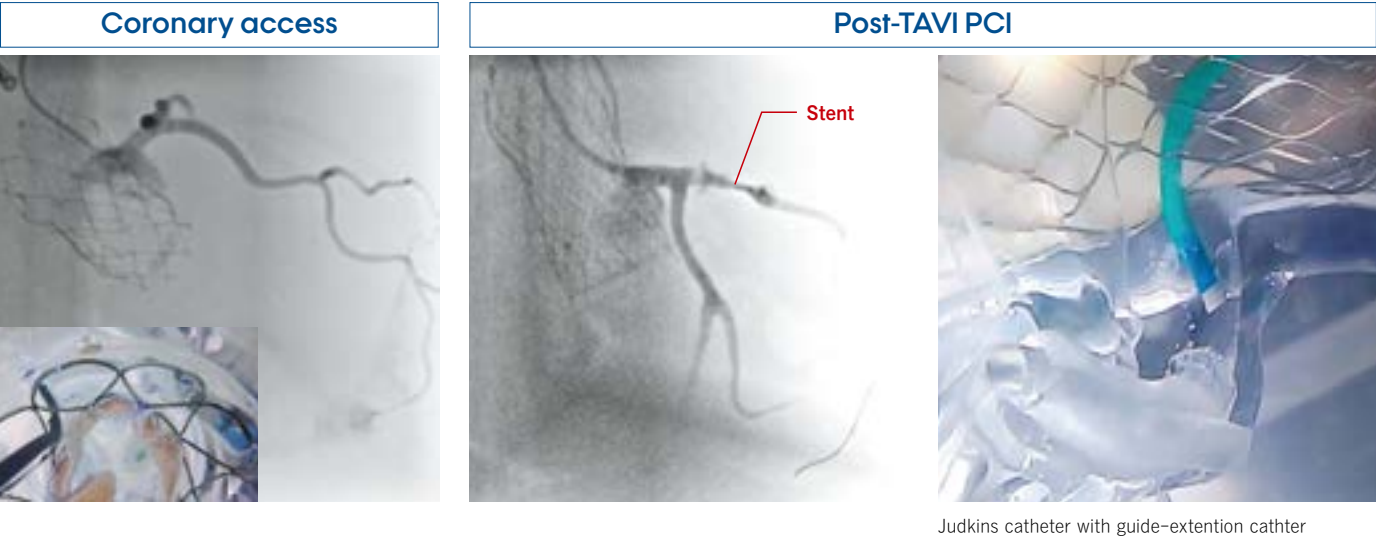
Horizontal aortic root anatomy causes difficulty in the valve positioning and delivery system retrieval process in TAVI procedure. This model has increased aortic angulation of 78° as measured between plane of aortic valve annulus and horizontal plane.

TAVI Videoscope Model (For Coronary access)



TAVI Videoscope Model can facilitate coronary access simulation training with a videoscope showing En Face view. This system can help interventional cardiologists understand the catheter manipulation when coronary access is needed for post-TAVI patients. With X-ray furuoroscopy, one can compare the routine AP or LAO view and En Face view as shown above.

Coronary access & Post-TAVI PCI

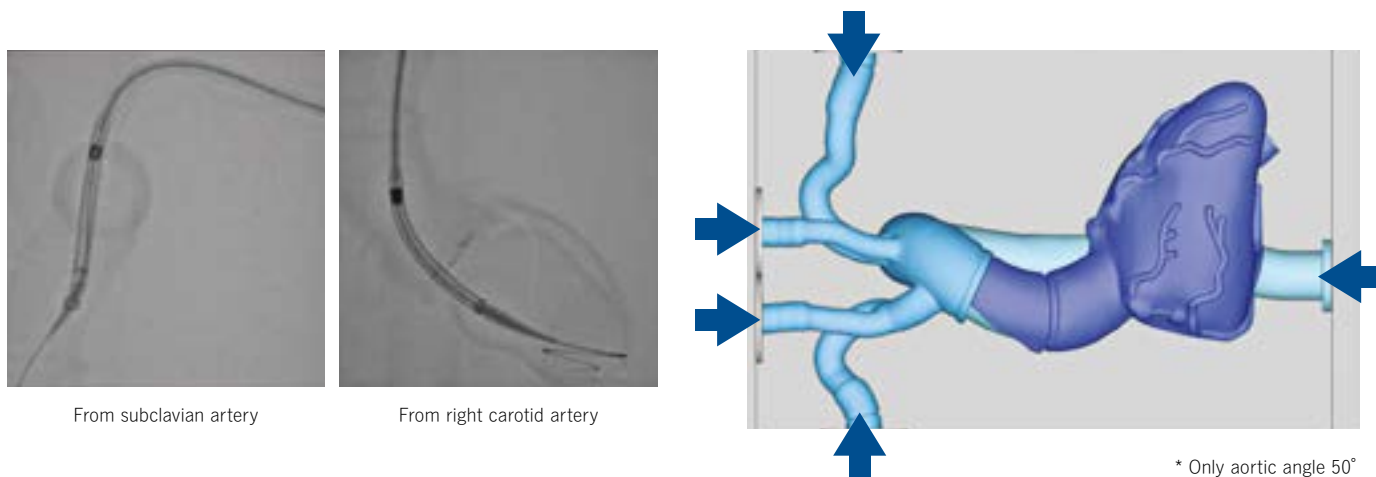


Judkins catheter with guide-extension cathter

TAVI Alternative Access Model



TAVI Alternative Access Model can facilitate simulation training for prosthetic valve implantation from both carotid and subclavian artery. This system can help interventional cardiologists understand the procedure of alternative approaches when standard femoral access is not recommended. Cerebral embolic protection (CEP) procedure simulation can be also realized with this model with or without X-ray.



Components

Heart model, valve parts and pump are common to conventional TAVI model.



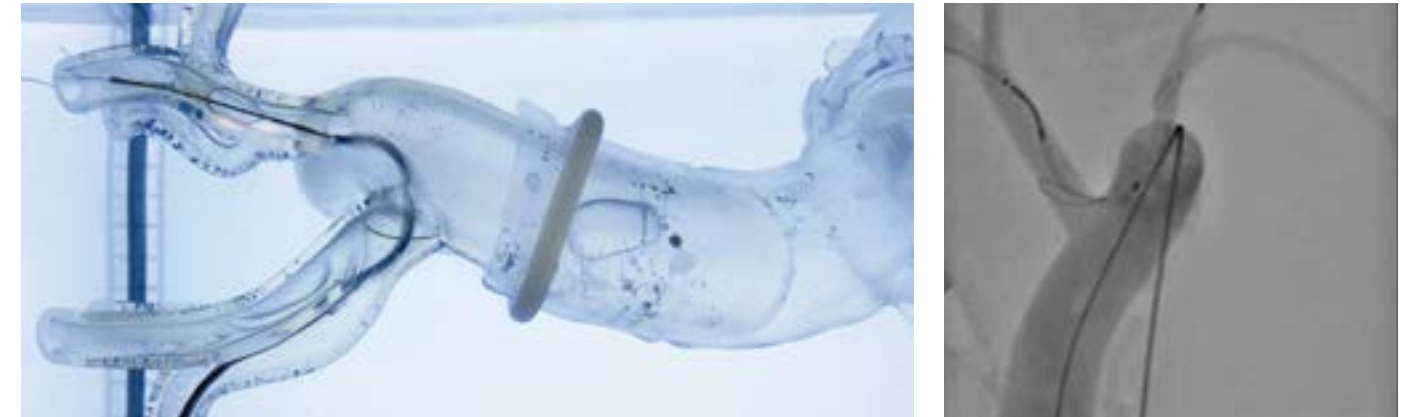
Special tank for TAVI Alternative Access

HEARTROID Pump Type-2

Camera Set

Carry Case

TAVI CEP Model (For Cerebral Embolic protection)



This model can facilitate the following series of simulation including 1. Cerebral embolic protection, 2. TAVI Valve implantation, 3. Post-TAVI coronary access & PCI (including pre-TAVI coronary protection) under X-ray fluoroscopy and camera view. Aortic angle variety: 37° /50° . With Videoscope / without videoscope

Components

Heart model, valve parts and pump are common to conventional TAVI model.



Special tank for TAVI CEP

HEARTROID Pump Type-2

Camera Set

Carry Case

TAVI CEP Dry Model



CEP Dry Model is a handy simulation kit focusing on understanding the usage of the cerebral embolic protection procedure during transcatheter valve implantation.

Components

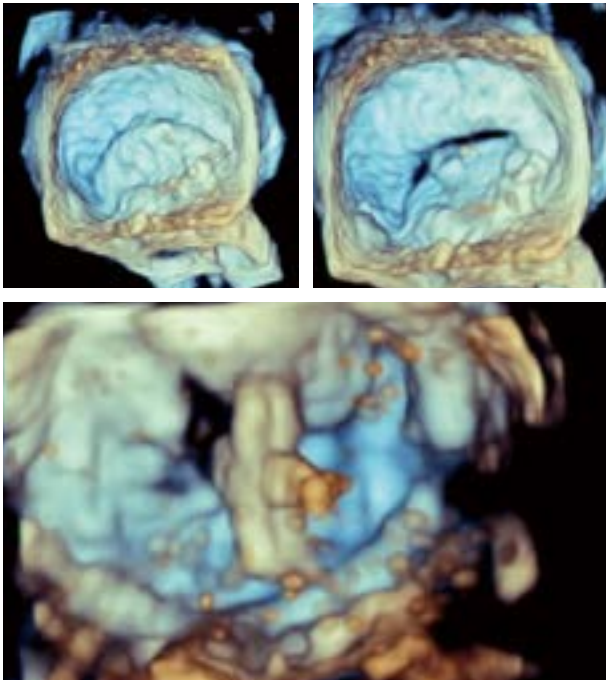
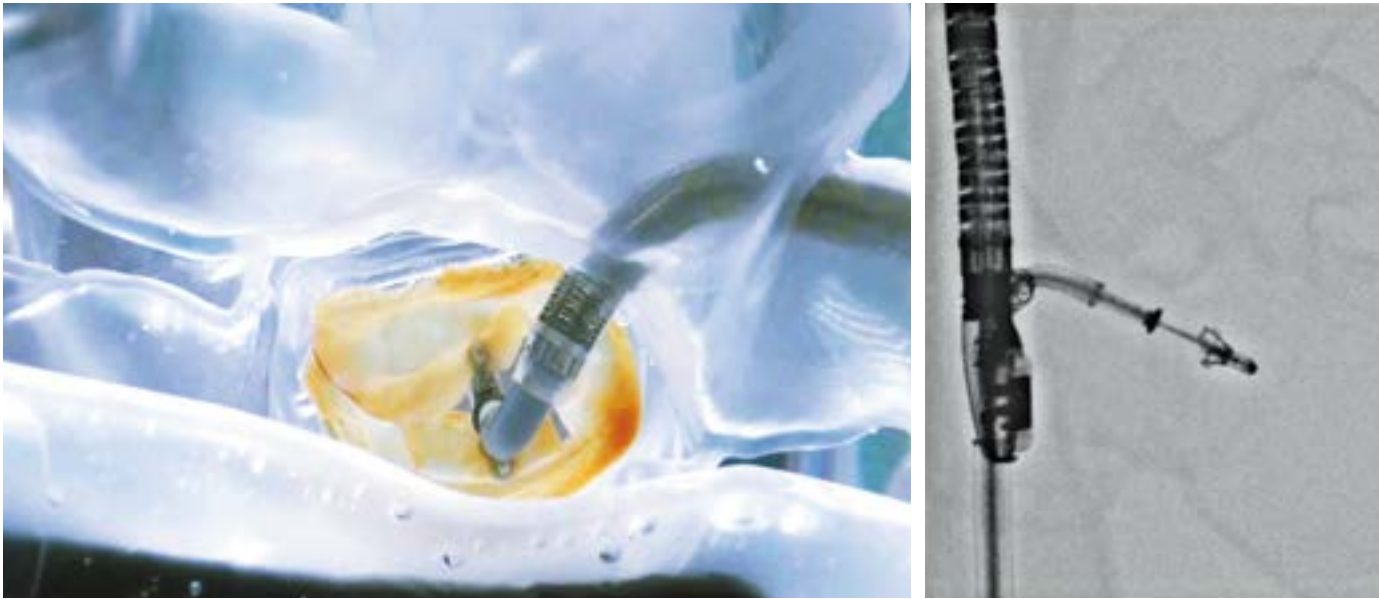


Vessel part for TAVI CEP Dry Model

LED Panel

Carry Case

MV Model



3D echographic image

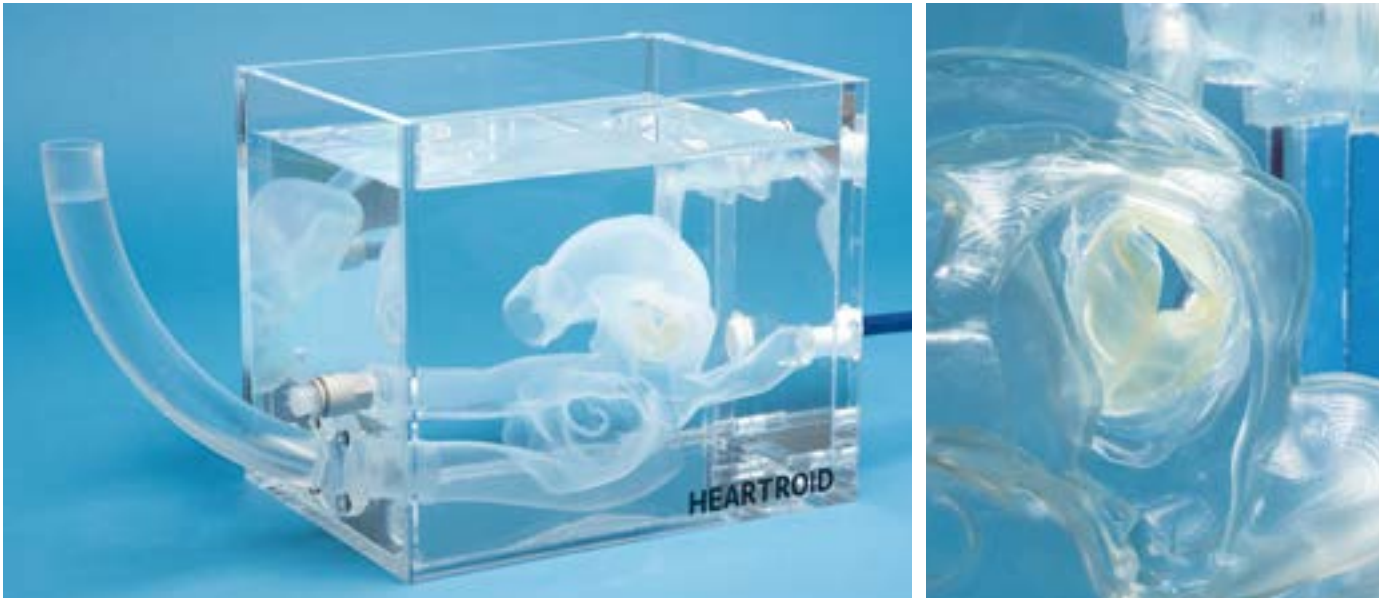
TEE image

This model allows simulation training of percutaneous mitral valve clipping (TEER: transcatheter edge-to-edge repair) under fluoroscopy and transesophageal echocardiography guidance. The mitral valve has a removal design, and it opens and closes with the pulsatile flow produced by the pump.

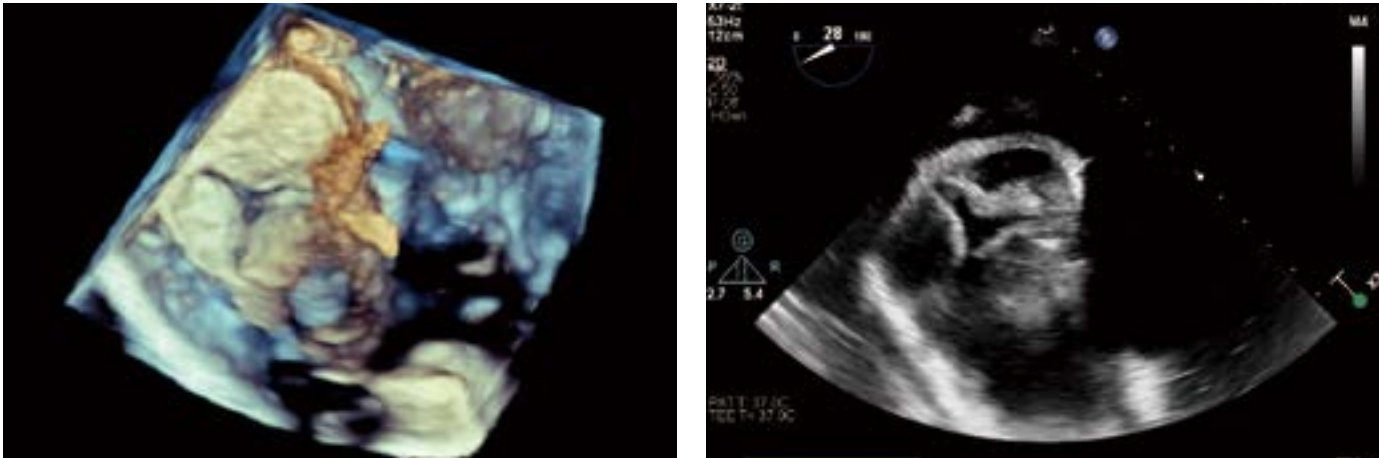
Components



TV Model



This model allows simulation training of percutaneous tricuspid valve clipping procedure (TEER : transcatheter edge-to-edge repair) under fluoroscopy and transesophageal echocardiography guidance. The tricuspid valve can open and close triggered by the pulsatile flow generated by the pump.



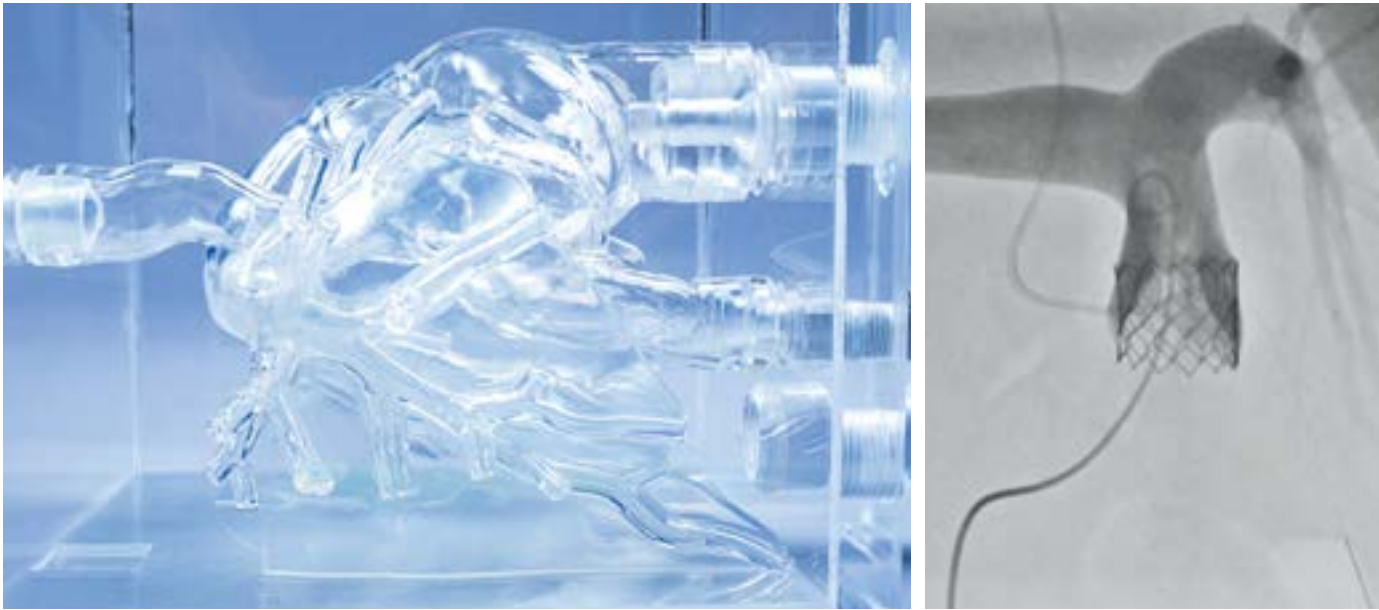
3D echographic image

2D image

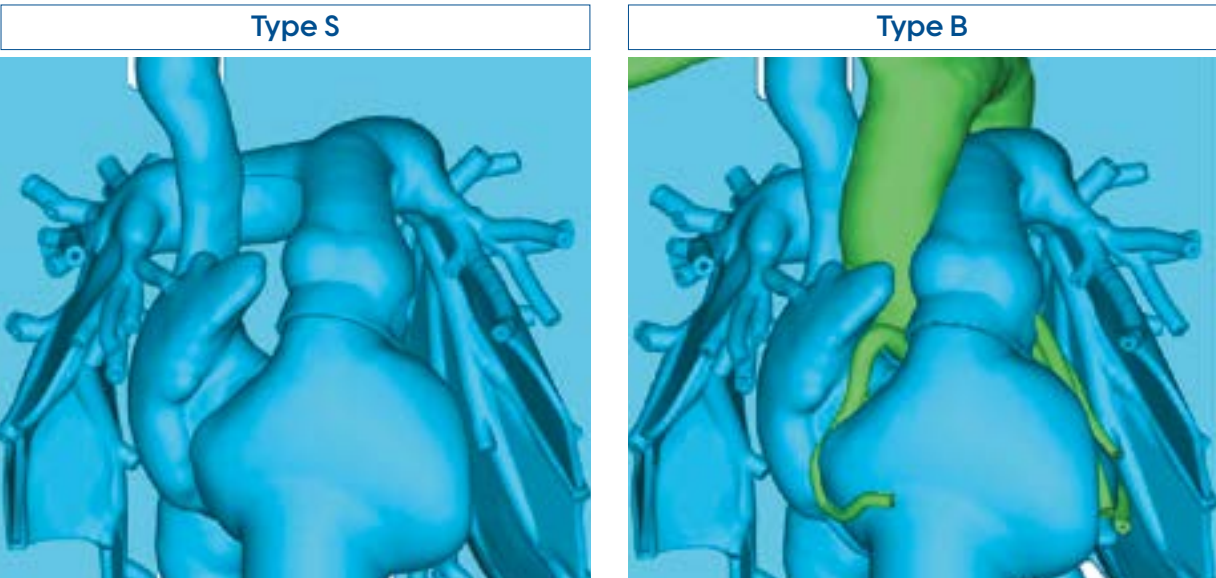
Components



TPVI Model



This model can facilitate TPVI (Transcatheter Pulmonary Valve Implantation) simulation training. Based on hybrid design concept, soft heart model with main pulmonary artery connected with hard peripheral pulmonary arteries can realize a real tactile feeling during the procedure as well as smooth valve removal process after implantation. There are two types of models which can be used under X-ray fluoroscopy; Type S for self-expandable valve implantation and Type B suitable for balloon-expandable valve, which is equipped with aorta and coronary arteries.



TypeS for self-expandable valve TypeB for balloon-expandable valve

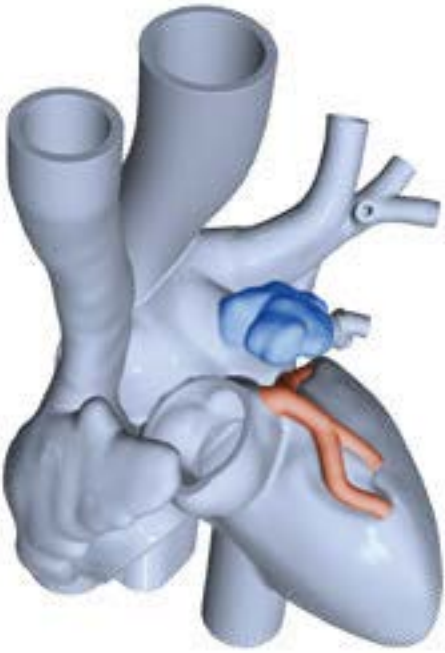
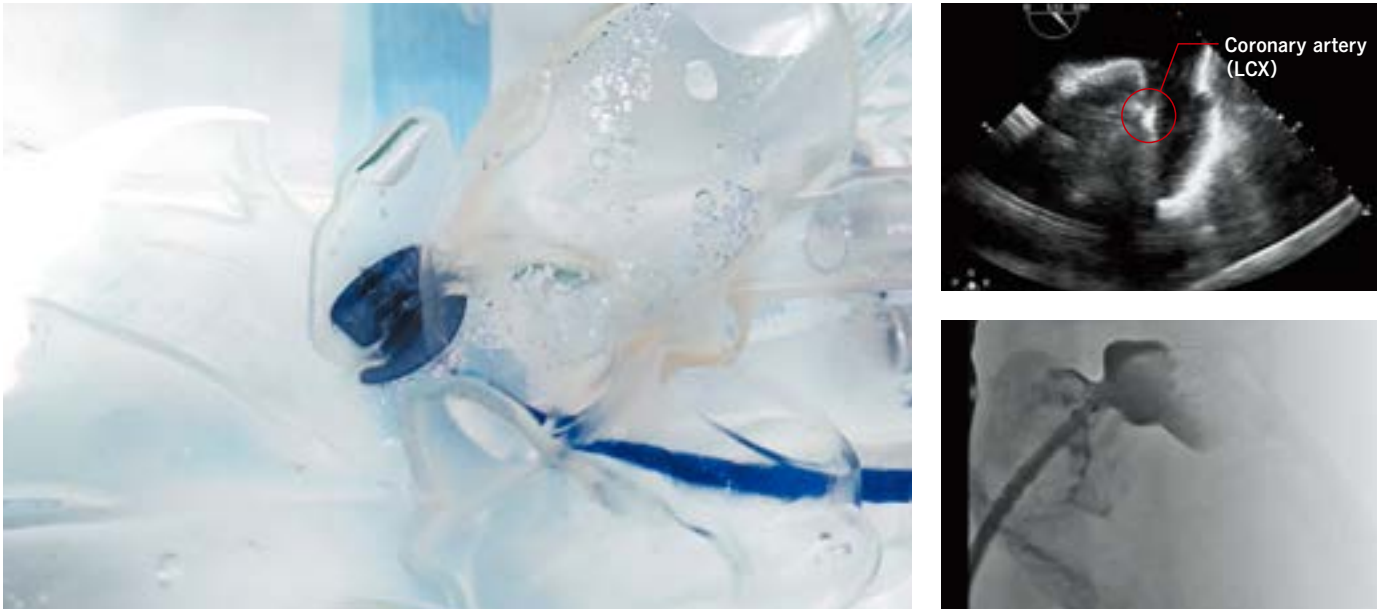
Components



TPVI Type S
needs type2 pump
only

TPVI Type B
needs both type1
and type2

LAA Closure Model

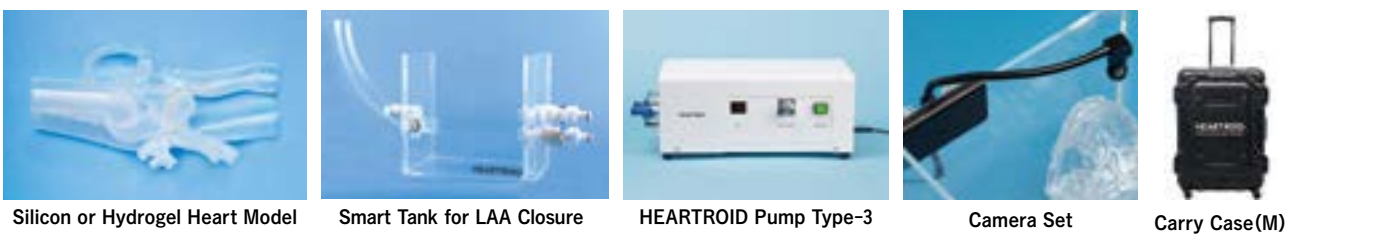


HEARTROID LAA closure model facilitates training for the LAA (left atrial appendage) closure procedure, a catheter-based operation for patients at risk of stroke due to atrial fibrillation. Guided by echocardiography, the delivery catheter can be inserted through the atrial septum and the occluder can be deployed in the LAA. Blood flow from the left atrium to the left ventricle is simulated, so the location of the occluder can be confirmed by X-ray fluoroscopy during the procedure.



Wind Sock model Chicken Wing model Broccoli model
* Wind Sock model LAA size variety Orifice diameter: 23mm and 32mm

Components



TSP Model



HEARTROID TSP model is designed for training in atrial septal puncture (TSP) procedure guided by imaging modalities such as X-ray fluoroscopy, transoesophageal ultrasound (TEE) and intracardiac echocardiography (ICE). Camera images can help trainees plan where to puncture and actually confirm the punctured position following the procedure, allowing simulation training for the ideal puncture position according to the purpose, such as catheter ablation or SHD procedures. You can also learn how to navigate with ICE, how to move a steerable catheter and how to perform radiofrequency-based puncturing techniques.

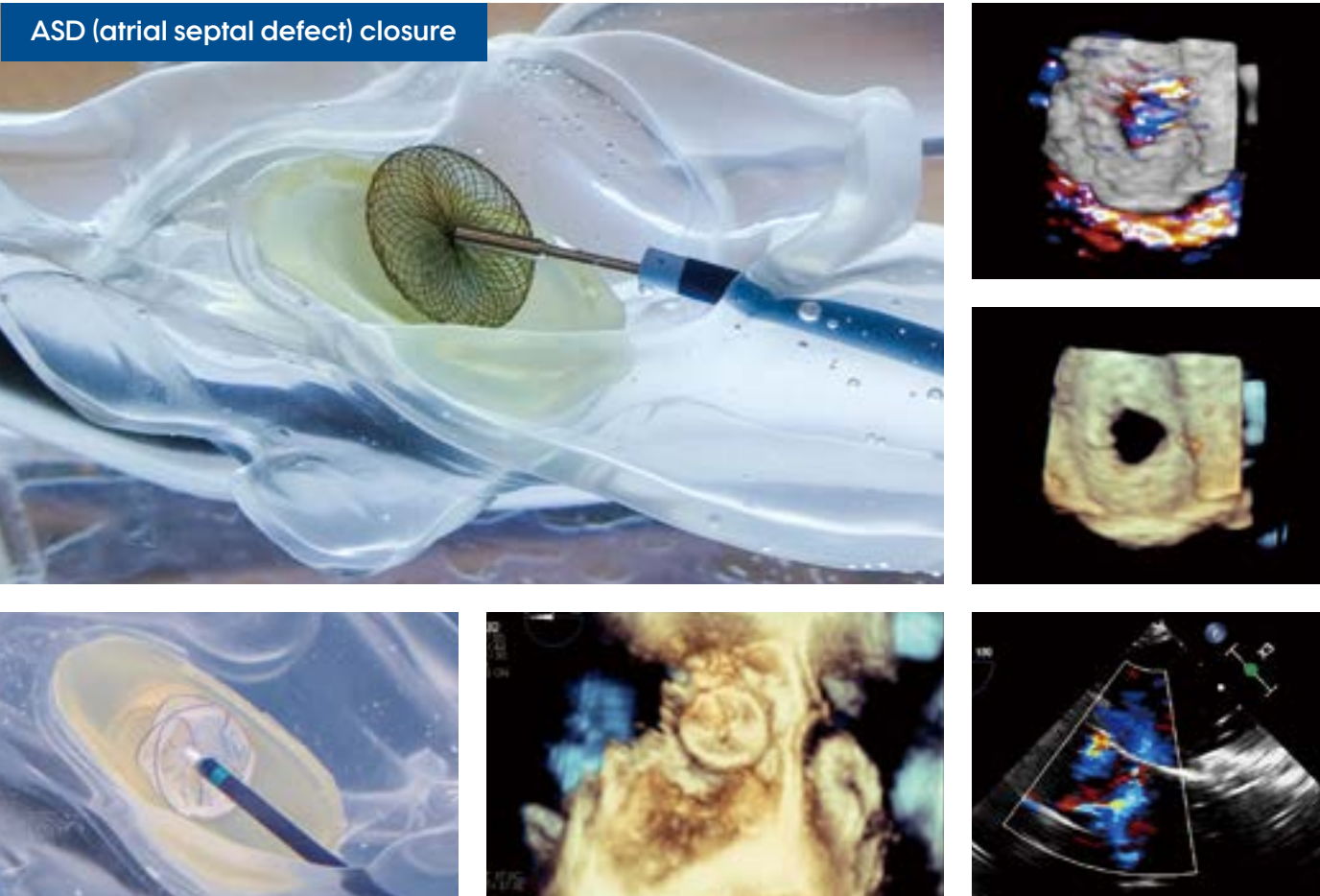


Components

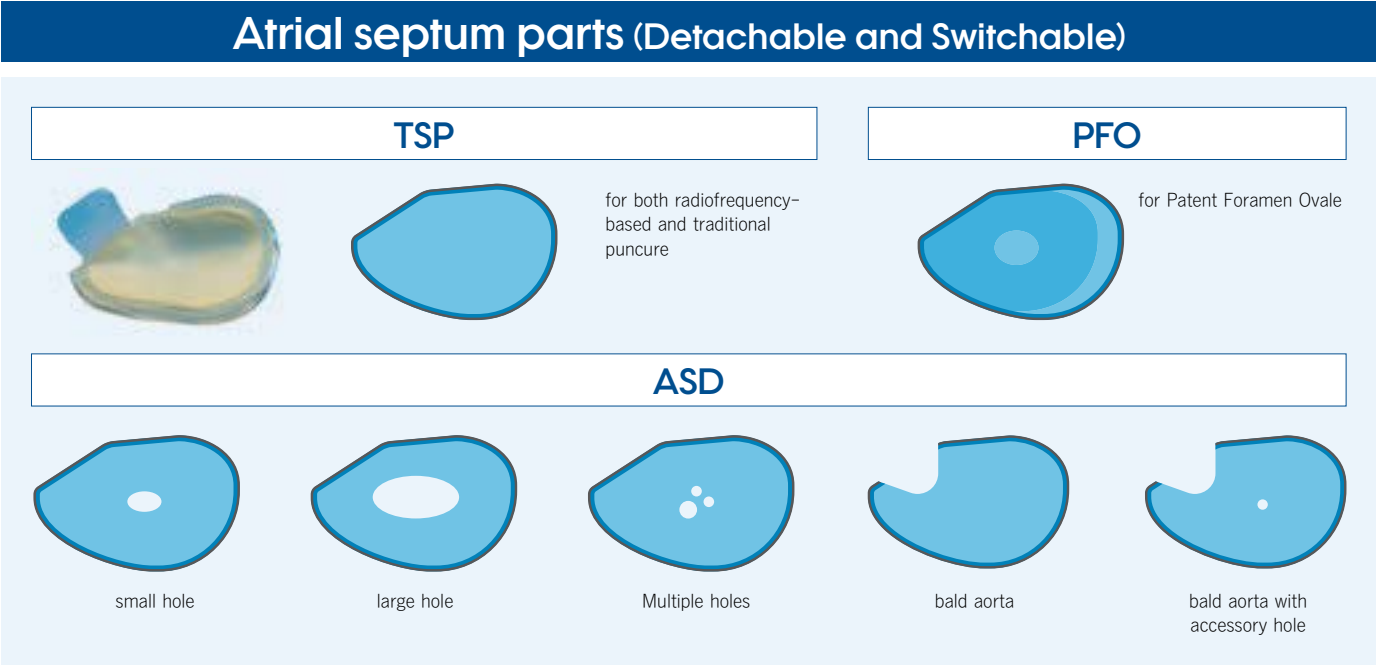
TSP and ASD/PFO closure are sharing the same heart model and pump so that both procedures can be realized by just changing the atrial septum parts.



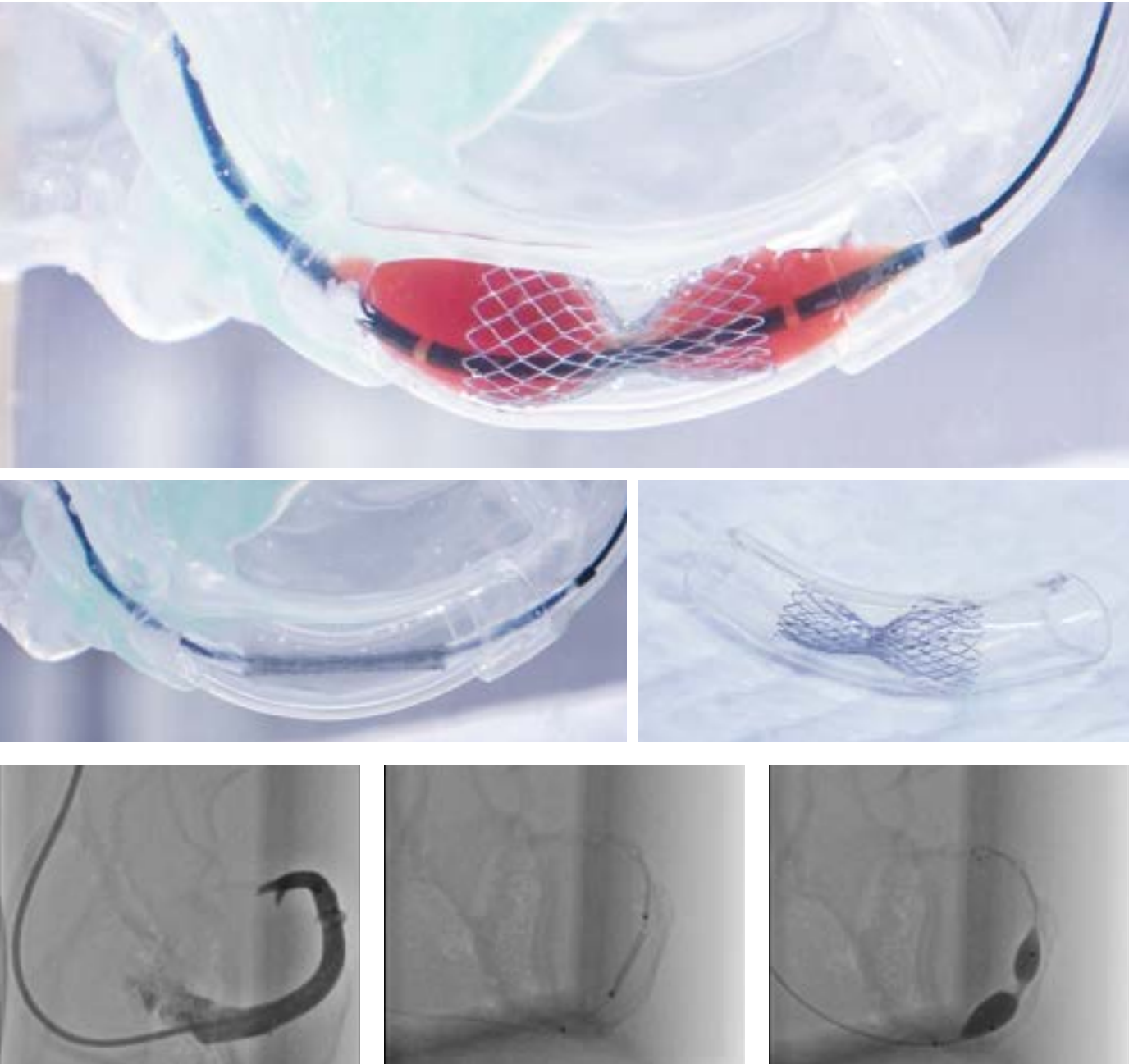
ASD/PFO closure Model



HEARTROID ASD closure model facilitates training for the ASD (atrial septal defect) and PFO (Patent Foramen Ovale) closure procedure, a catheter-based operation for patients with congenital defects or foramen of the atrial septum. Guided by echocardiography, a delivery catheter can be inserted through the septal defect into the left atrium, and the closure device can be deployed across the ASD/PFO. As blood flow from the left atrium to the left ventricle is simulated, the location of the occluder can be confirmed by X-ray fluoroscopy during the procedure.



CSR Model



HEARTROID CSR model is designed for training in Coronary Sinus Reducer deployment under X-ray fluoroscopy and camera view. This model can facilitate how to plan where to deploy the device and learn the entire procedure from coronary venography to safe removal of the delivery catheter through the simulation training. Coronary sinus part is removable and can be moved on to the next procedure immediately.

Components



Heart Model for CSR



Smart Tank for CSR



HEARTROID Pump Type-I



Camera Set



Carry Case



EP

HEARTROID EP series cover electrophysiological procedures from geometry creation in catheter ablation, ICE imaging, PVI with PFA and cryoballoon to trans-venous lead implantation and leadless pacemaker deployment.

EP Model



EP Model

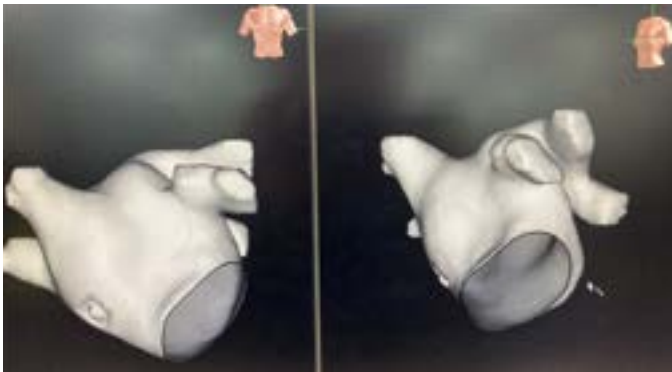
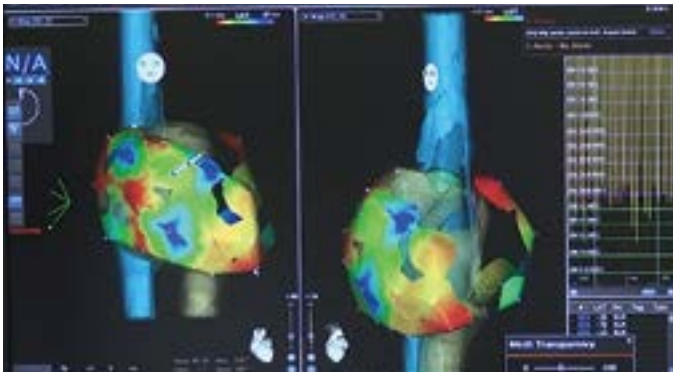


CRT Model



Leadless PM Model

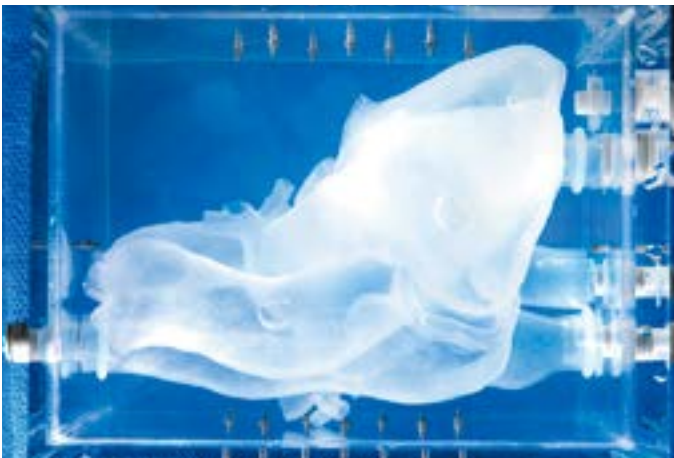
EP Model



HEARTROID EP model facilitates technical training for catheter manipulation and 3D mapping, which are basic skills required for catheter ablation. With this model, the Brockenbrough Method (atrial septal puncture) guided by ICE (intracardiac echocardiography) can also be simulated. The model is appropriate for both the internal jugular and femoral vein approach.

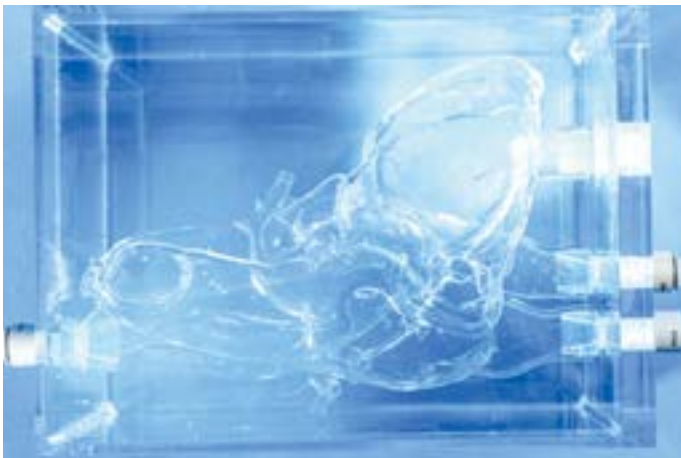
Material

Hydrogel series



For Electromagnetic field and ICE imaging

Silicon series

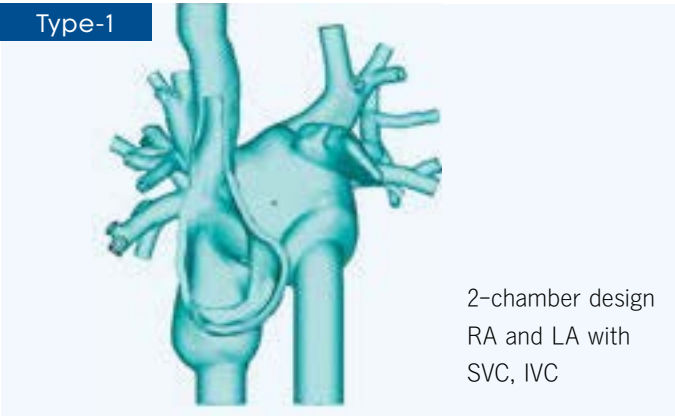


For camera view

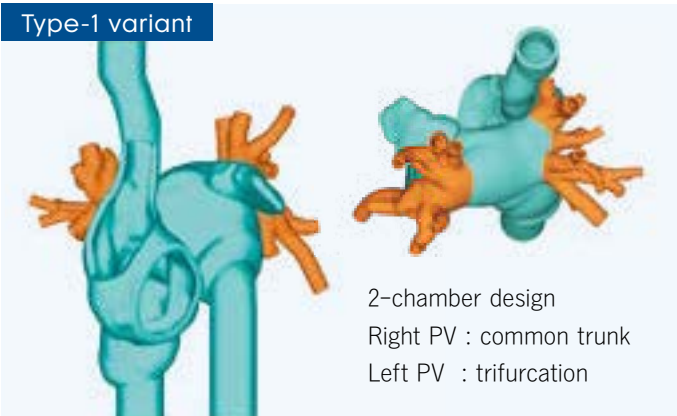
Geometry

Model size can be magnified or reduce depending your request.

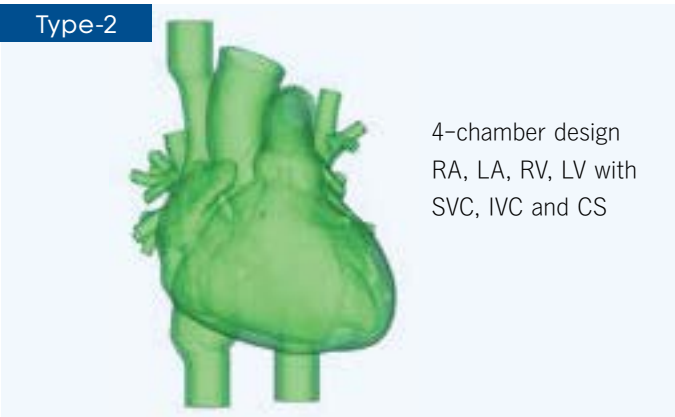
Type-1



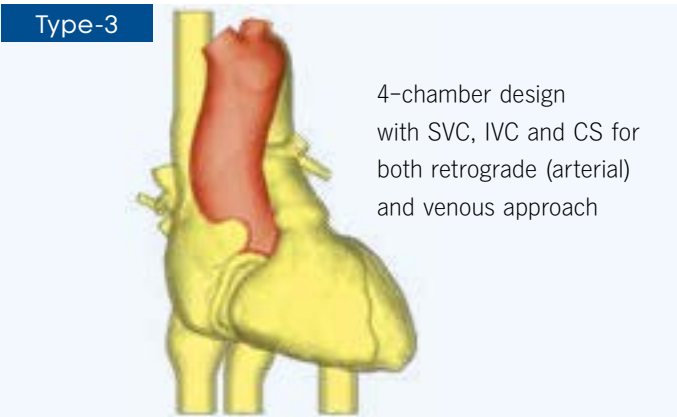
Type-1 variant



Type-2



Type-3



Compatible procedures

	Type1		Type2		Type3	
	2-ch		4-ch		venous and arterial approach	
	Silicon	Hydrogel	Silicon	Hydrogel	Silicon	Hydrogel
3D mapping (geometry creation)		✓		✓		✓
ICE imaging				✓		✓
PVI with cryoballoon	✓					
Lead implantation for coronary sinus and branches			✓		✓	

Components



Heart model for EP
Silicon or Hydrogel



Smart Tank for EP



HEARTROID Pump Type-I



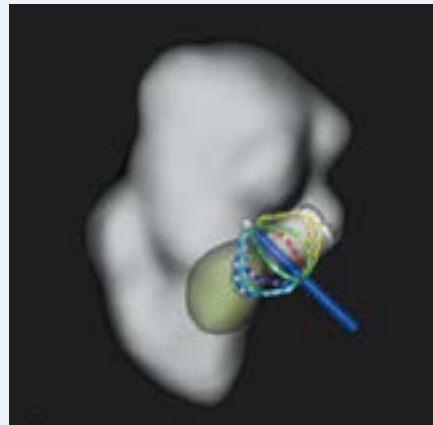
Camera Set



Carry Case (L)

Recommended procedures

3D mapping (Geometry Creation)



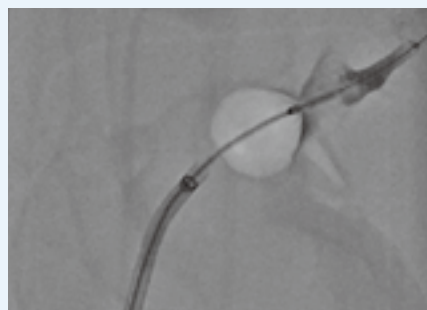
Hydrogel heart model with conductive property can facilitate the simulation of geometry creation process, which is the fundamental procedure for electrophysiologists. Type1 and 2 are designed to be accessed from IVC through atrial septum, and retrograde approach from the femoral artery is acceptable with Type3.

PVI (PFA and Cryoballoon ablation)

2-chamber



4-chamber



Cryoballoon

HEARTROID PVI model facilitates simulated training of a pulmonary vein isolation procedure, with or without X-ray visualization. During cryoballoon catheter ablation, the operator is able to check whether pulmonary vein flow is blocked appropriately using a pulsatile pump which is included in the standard set. This model features all four pulmonary veins (RSPV, RIPV, LSPV, LIPV), and ICE (intracardiac echocardiography) is usable when passing through the atrial septum.

CRT Model



HEARTROID CRT (Cardiac Resynchronization Therapy) model is designed for training under X-ray fluoroscopy and camera view. This model can facilitate the simulation training of how to insert the intravenous leads from subclavian/axillary vein to the coronary sinus (CS), right ventricular apex and atrial septum. Coronary venography can be realized with the pulsatile pump. Each part of coronary sinus, right ventricular apex and atrial septum is removable and can be moved on to the next procedure immediately.

Lead implantation for coronary sinus and branches



Silicon-based transparent heart model with CS (coronary sinus) facilitates the lead implantation procedure under X-ray fluoroscopy and camera view. Coronary sinus and marginal veins can be visualized with contrast injection.

Components



Heart Model for CRT



Smart Tank for CRT



HEARTROID Pump Type-I

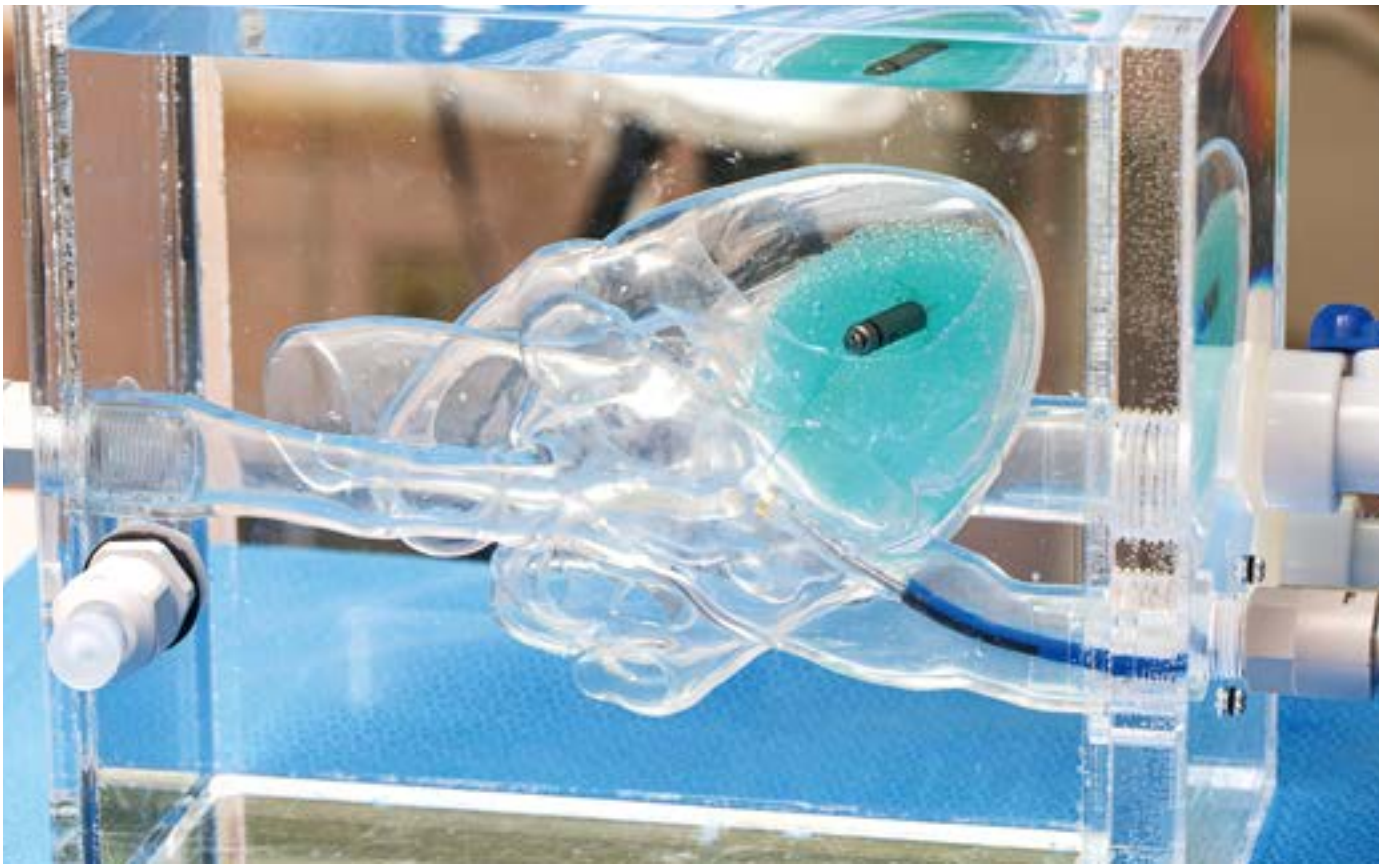


Camera Set

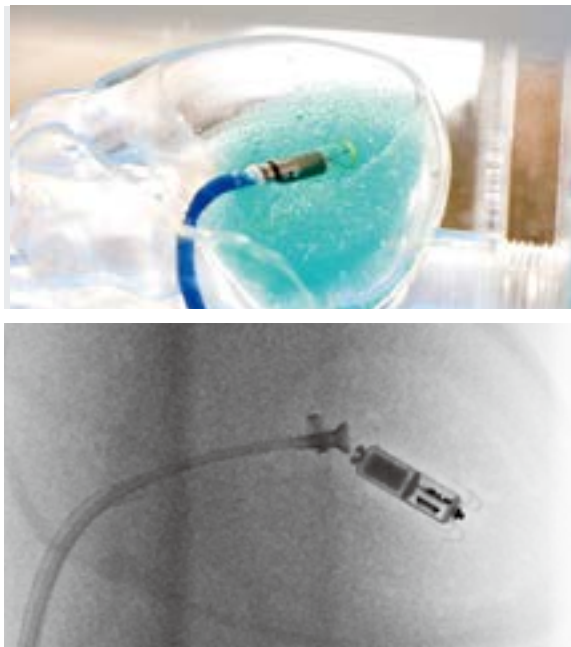


Carry Case

Leadless PM Model

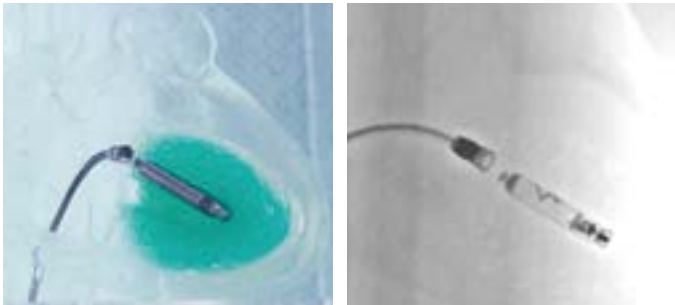


HEARTROID Leadless PM model facilitates simulation training of a leadless pacemaker device implantation procedure, with or without X-ray visualization. The operator is able to simulate full procedure; inserting a delivery catheter from femoral vein via right atrium into right ventricle, confirming the position of the device on the right ventricular septum with contrast under X-ray and deployment followed by checking fixation process.

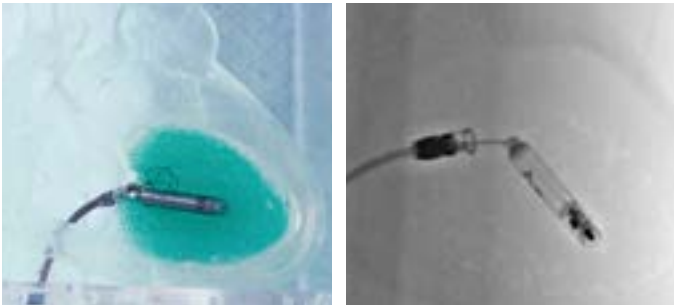


Leadless PM model facilitates both device implantation and retrieval procedure with or without X-ray fluoroscopy. By combining X-ray and camera view, the simulation training will be more efficient by visualizing the behavior of the device in the heart, which is not visible in the real case.

Implantaion procedure



Retrieval procedure



Components



Heart Model for Leadless PM



Smart Tank for Leadless PM



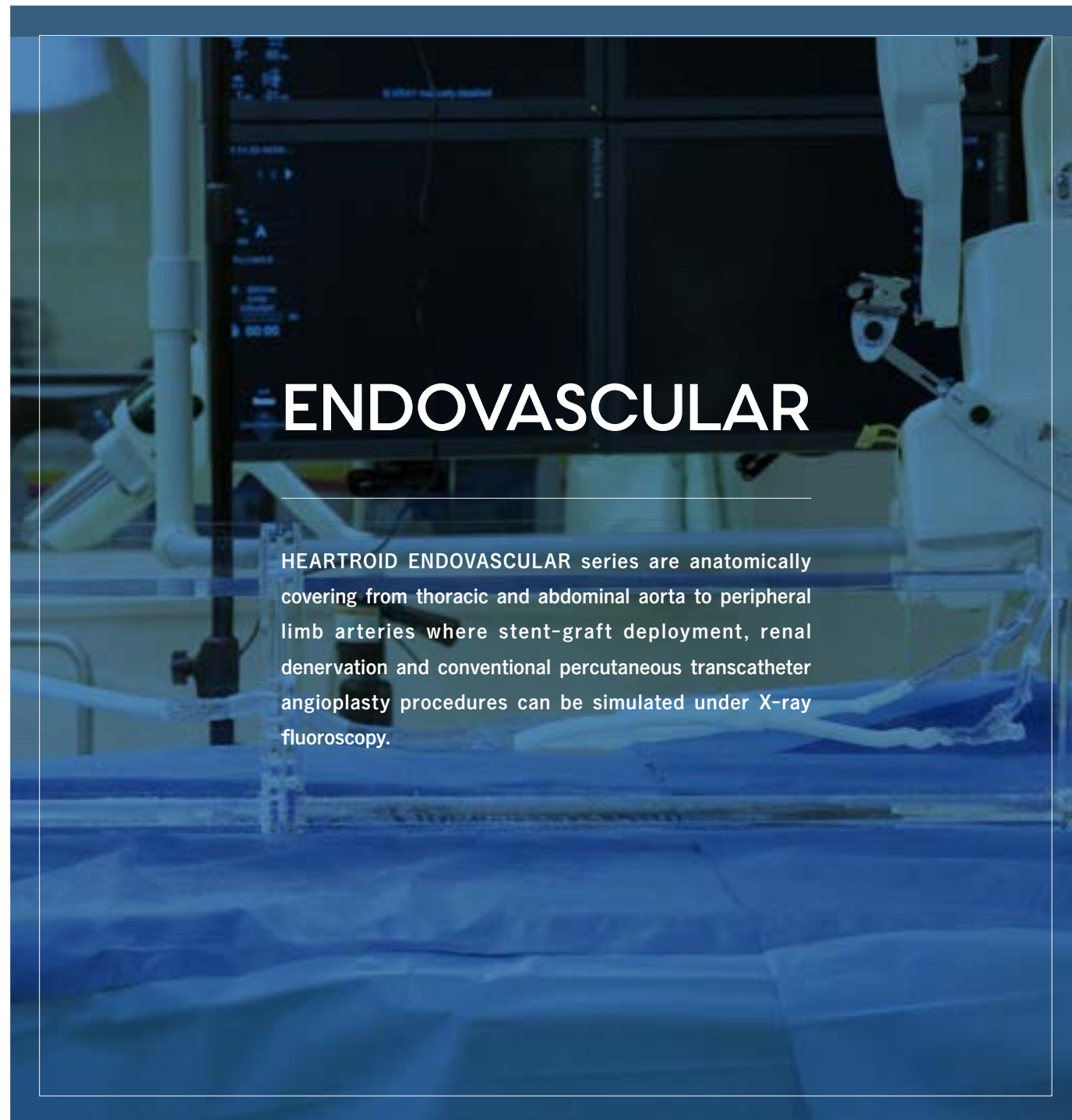
HEARTROID Pump Type-3



Camera Set



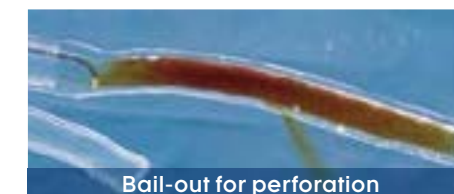
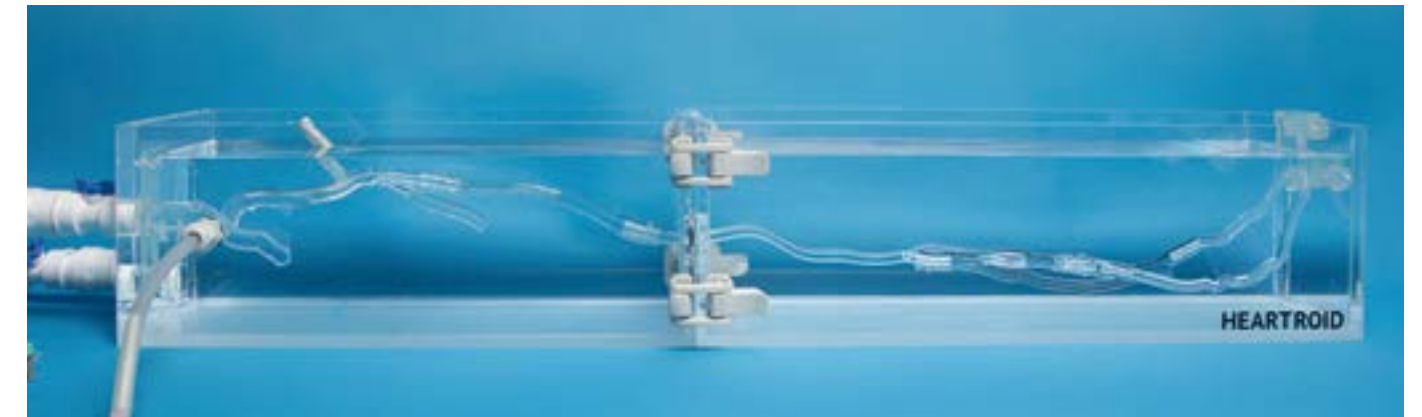
Carry Case



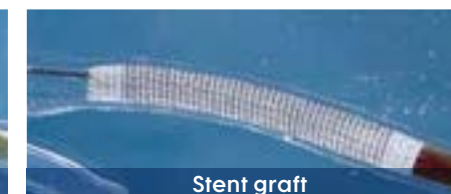
ENDOVASCULAR

HEARTROID ENDOVASCULAR series are anatomically covering from thoracic and abdominal aorta to peripheral limb arteries where stent-graft deployment, renal denervation and conventional percutaneous transcatheter angioplasty procedures can be simulated under X-ray fluoroscopy.

EVT Model



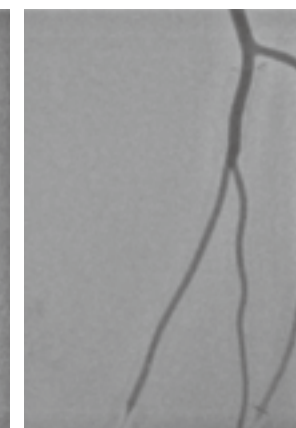
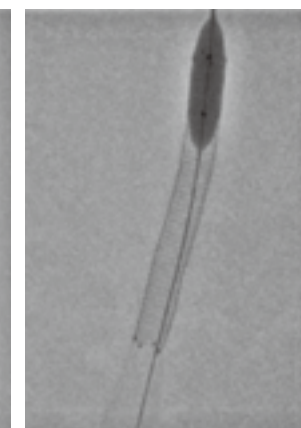
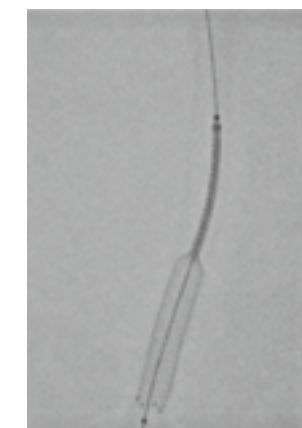
Bail-out for perforation



Stent graft



Laser ablation



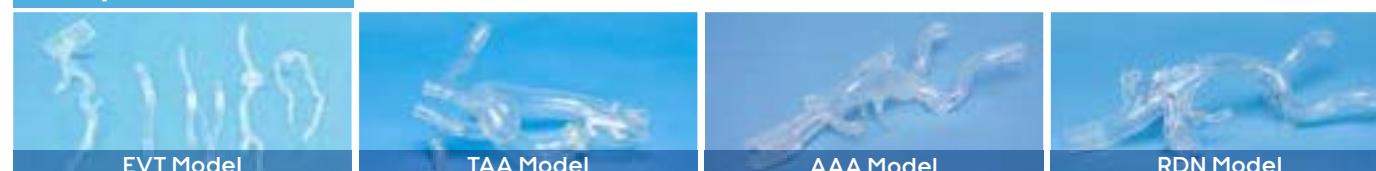
HEARTROID EVT model facilitates simulation for peripheral intervention procedures under X-ray fluoroscopy and non-fluoroscopic situation. This vessel model covers from the terminal aorta to the plantar arch, and supports both retrograde and antegrade approaches. Smart tank for EVT model can be divided between the above-knee area (AK) and the below-knee area (BK) for easy setup.

Lesion parts (Detachable & Disposable)



Similar to the HEARTROID coronary artery model, this system can incorporate detachable lesion parts including stenosis, chronic total occlusion (CTO) and severe calcification, thus allowing procedures of various cases such as stent deployment and debulking procedures.

Peripheral Model



Components



Vessel Model

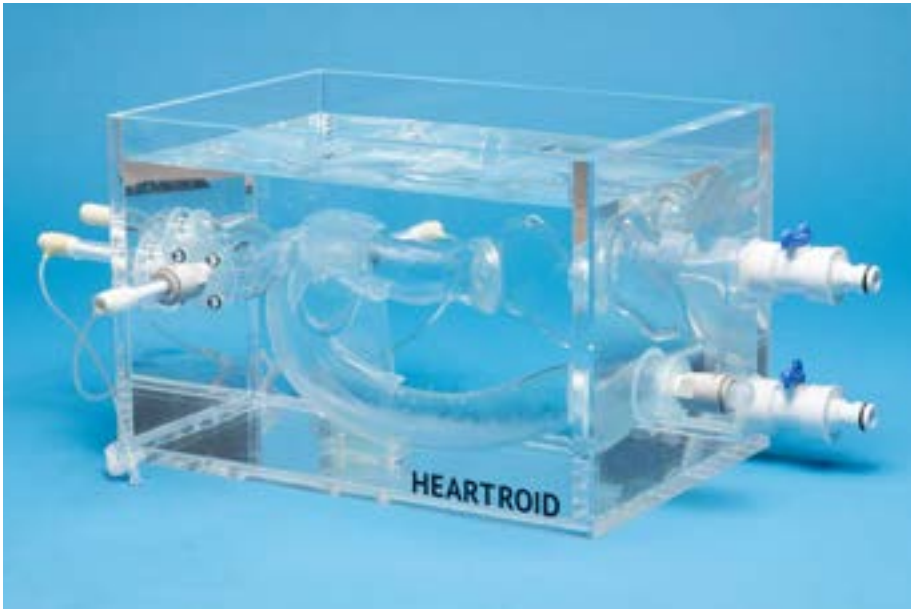
Smart Tank for EVT

HEARTROID Pump Type-I

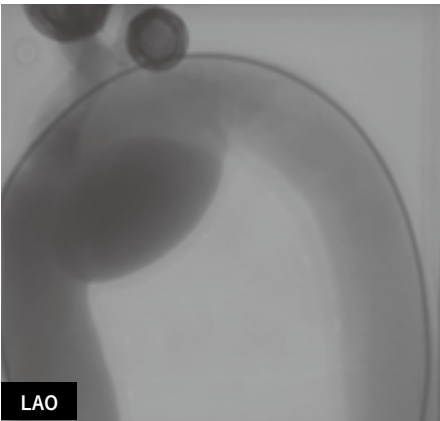
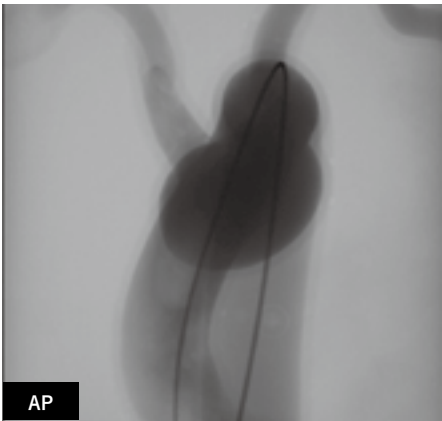
Camera Set

Carry Case

TAA Model



HEARTROID TAA model is designed for training in thoracic stent graft deployment under X-ray fluoroscopy and camera view. This model can facilitate how to plan where to deploy the device and learn the entire procedure from aortography to safe removal of the delivery catheter through the simulation training. We have two models based on the position of aneurysm; one is positioned at distal aortic arch and the other one is positioned at the branches of cerebral vessels.



Components



Model for TAA



Smart Tank for TAA



HEARTROID Pump Type-2



Camera Set



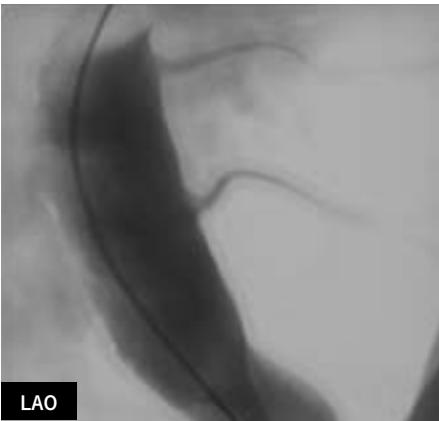
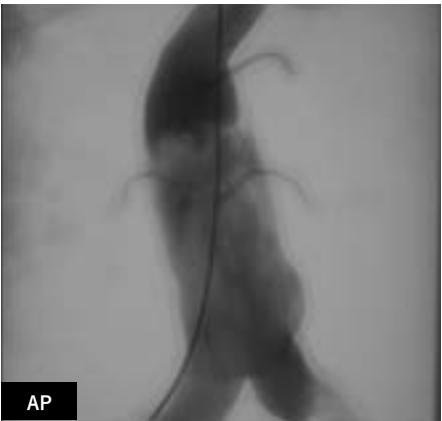
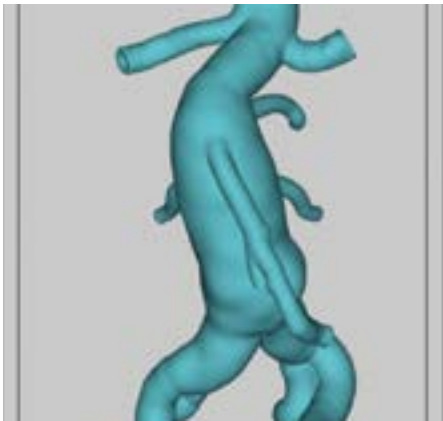
Carry Case (L)



AAA Model



HEARTROID AAA model is designed for training in abdominal stent graft deployment under X-ray fluoroscopy and camera view. This model can facilitate how to plan where to deploy the device and learn the entire procedure from aortography to safe removal of the delivery catheter through the simulation training. Aortic aneurysm is positioned at infra-renal aorta. Branches include bilateral renal arteries, testicular arteries and inferior mesenteric artery.



Components



Model for AAA



Smart Tank for AAA



HEARTROID Pump Type-I

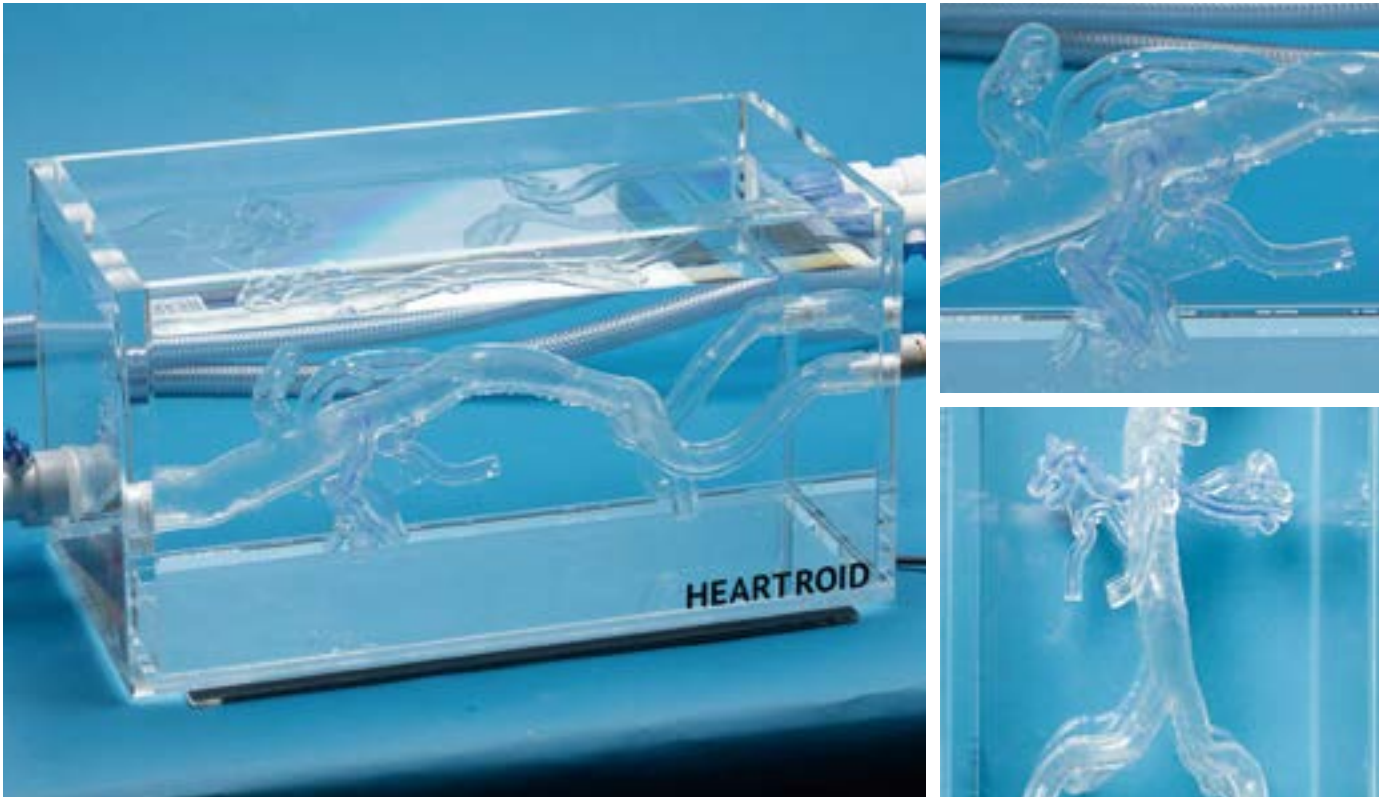


Camera Set

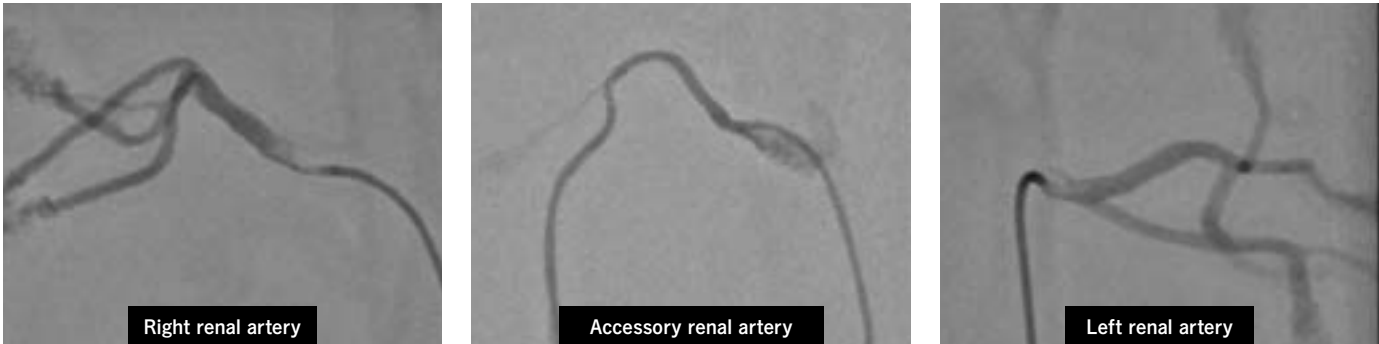


Carry Case (L)

RDN Model

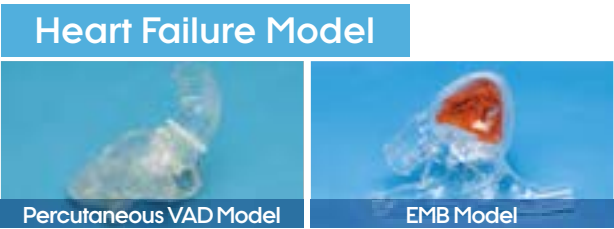
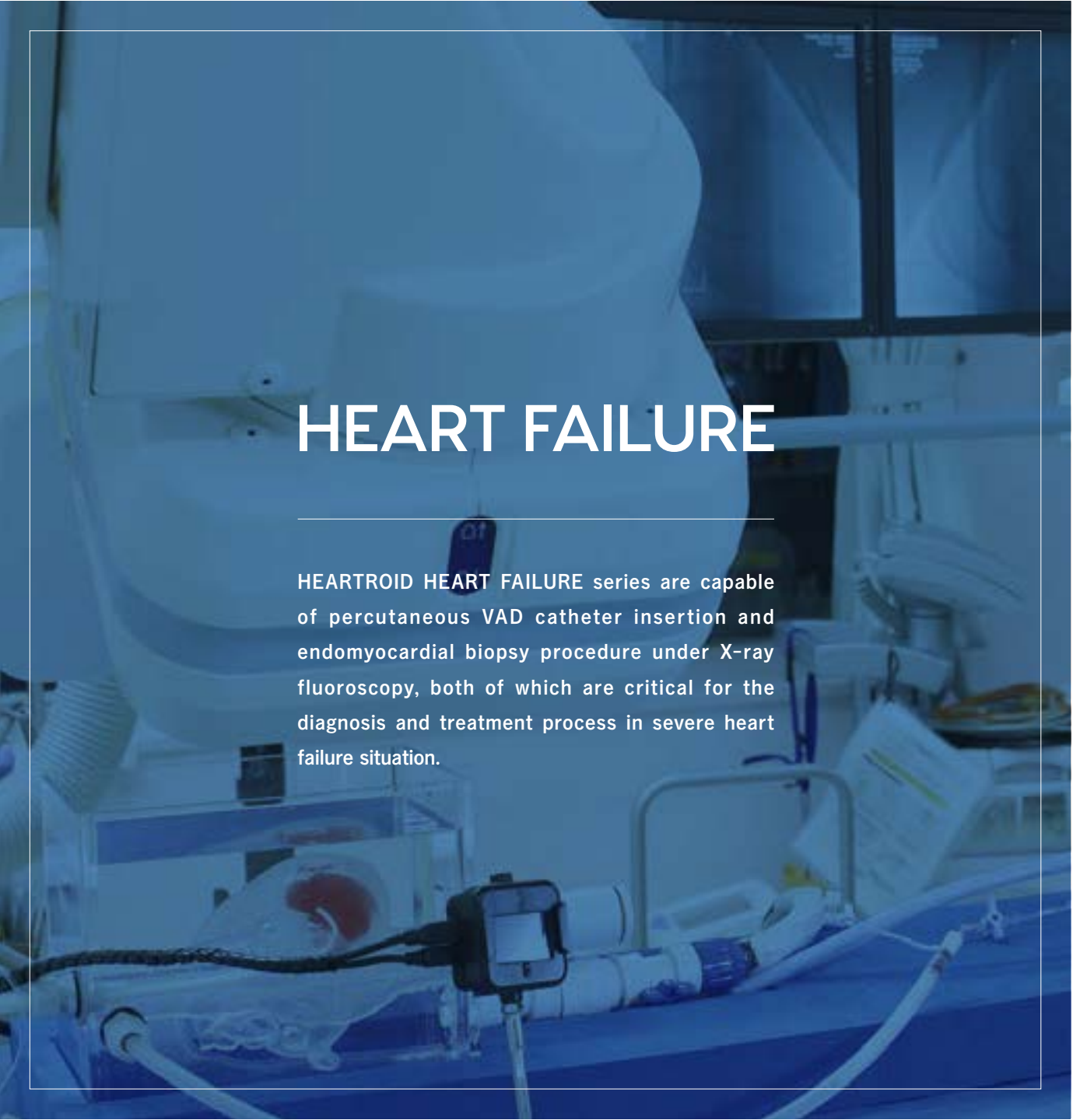


HEARTROID RDN model allows trainees to understand how to manipulate catheters during RDN (renal denervation) procedure with or without X-ray fluoroscopy. With a pulsatile pump included in the set, blood flow from the aorta to the extremity can be simulated and verified by realistic angiographic imaging. Right renal artery designed to fit Judkins right has an accessory artery and left renal artery is designed to fit IMA-shaped guiding catheter.

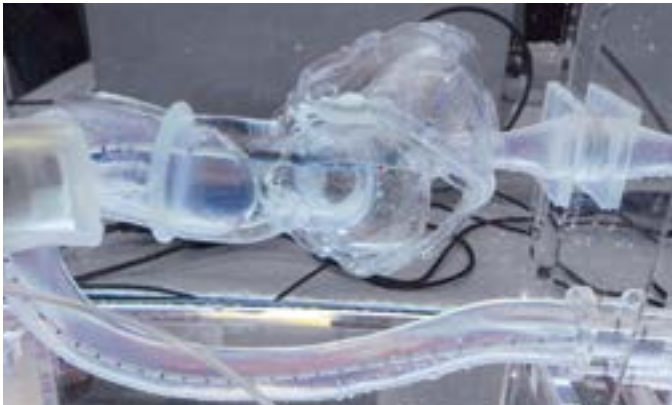
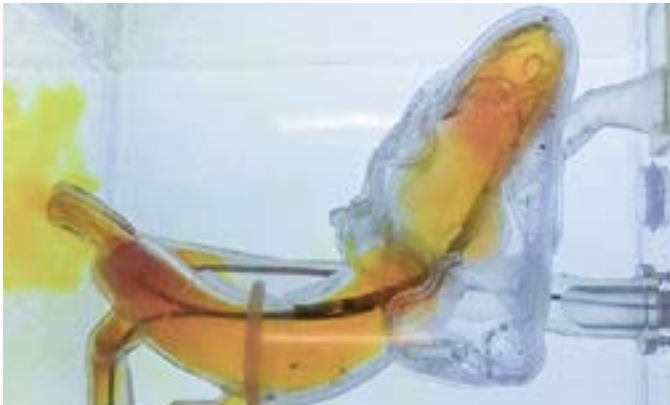


Components

Product specifications can be customized and are subject to change without notice. Please contact JMC for details.



Percutaneous VAD Model



HEARTROID Percutaneous VAD (ventricular assist device) model is designed for training under X-ray fluoroscopy and camera view. This model can facilitate how to insert the device from femoral or subclavian artery to the appropriate position. Left ventricle contracts with the pulsatile pump, so it can visualize the comparative situation with or without the support of percutaneous VAD. It can also facilitate the visualization of the coronary flow with X-ray angiography or the camera along with the dye injection.

Components



Model for Percutaneous VAD



Smart Tank for VAD



HEARTROID Pump Type-2



Artificial Vessel Graft

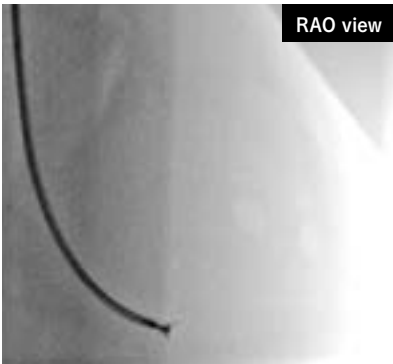
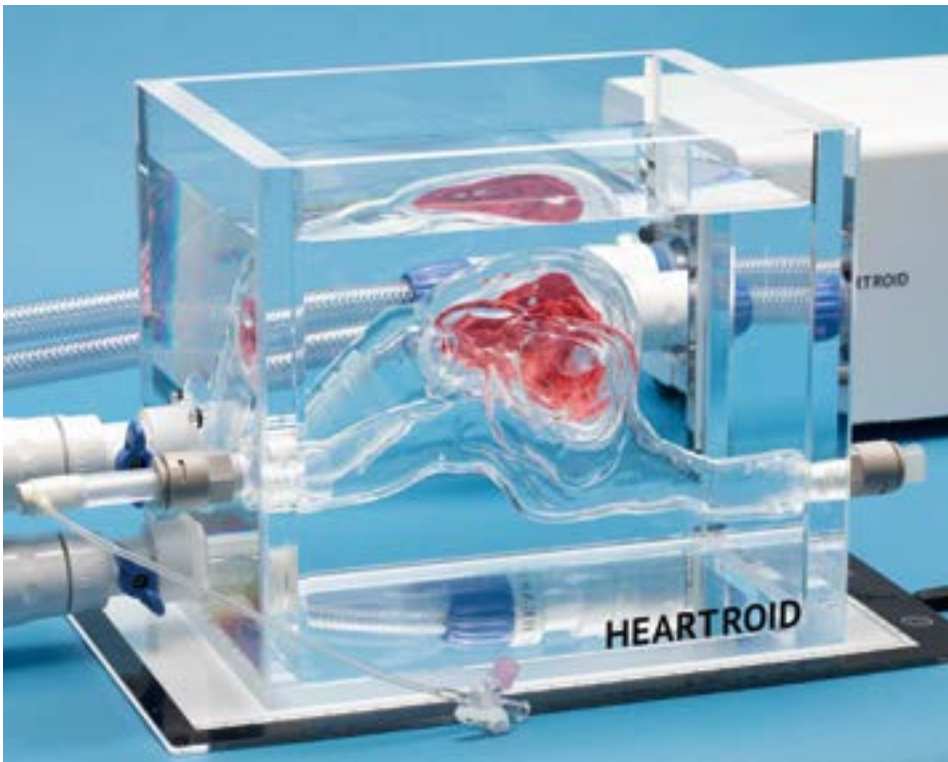


Camera Set



Carry Case (L)

EMB Model

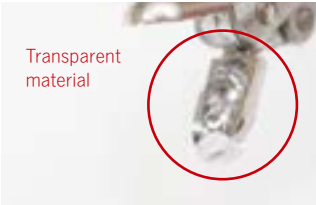


With this model, the myocardial biopsy procedure can be simulated under X-ray fluoroscopy, similar to the set-up in a real cath lab. The transparent heart model enables one to practice the procedure by confirming the direction of the sheath and forceps through both an X-ray image and a camera image.

As the material used to simulate the ventricular septum is different from that of the ventricular free wall, it is easy to confirm whether the tissue was removed from the appropriate area after the procedure. Using the X-ray image, it is possible to determine if the forceps are facing towards the free wall. The compact camera with a flexible arm can provide a clear image from various angles.



Tissue removed from the ventricular septum.



Tissue removed from the ventricular free wall, not the ventricular septum.



Components



Model for EMB



RV septum parts for EMB



Smart Tank for EMB



HEARTROID Pump Type-1



Camera Set



Carry Case

NV

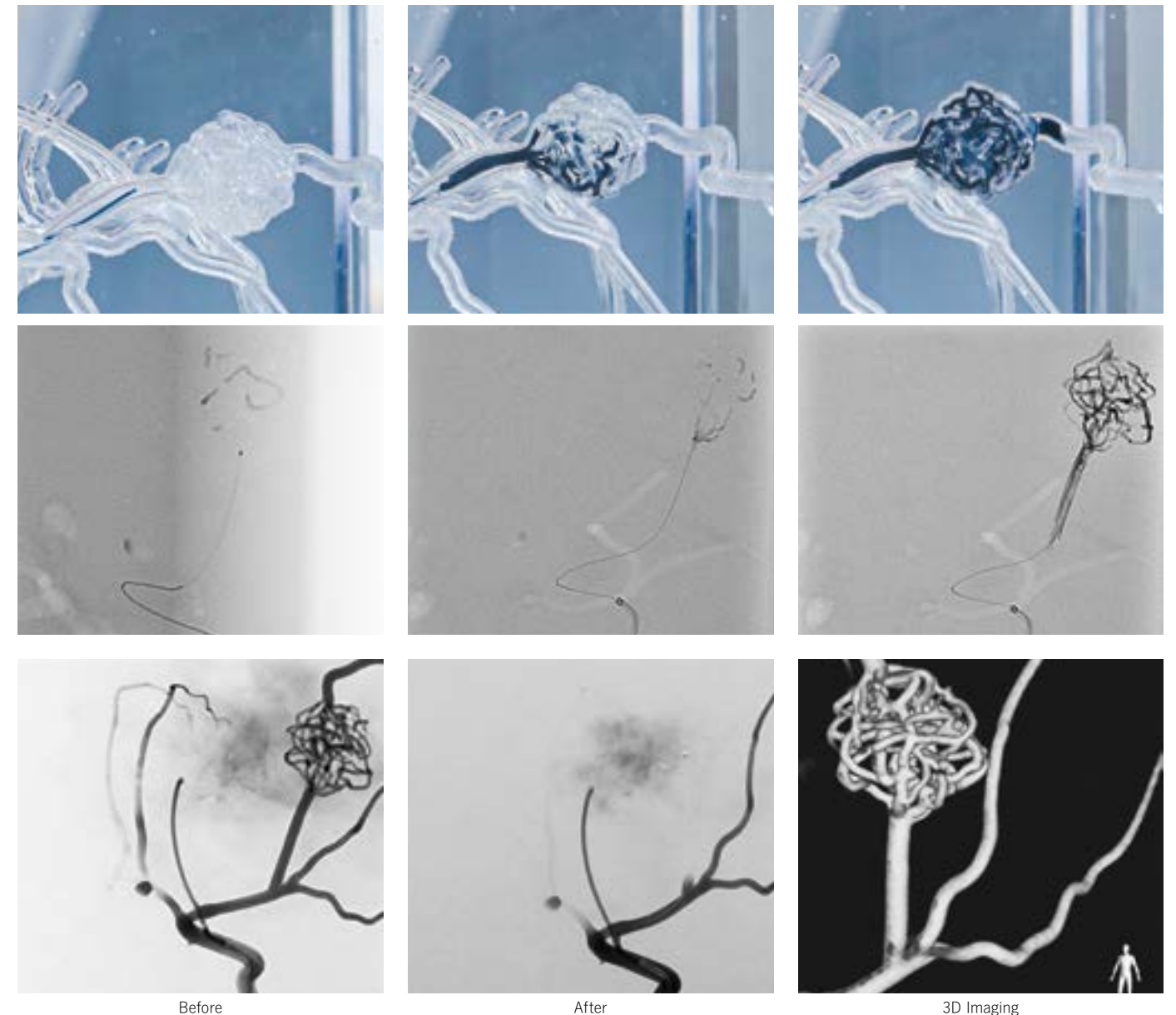
HEARTROID NV is the first neurovascular model as HEARTROID brand, which has a lot of experience in cardiac catheterization simulators.

This model realistically reproduces the tactile feeling of catheter operation as well as the way it looks under X-ray fluoroscopy by making the most of our technology accumulated to date.

The HEARTROID NV is ideal for physicians seeking to improve their skills through simulation training and for sharing the procedures with brand-new devices.

AVM embolization

AVM (arteriovenous malformation) embolization can be facilitated under X-ray fluoroscopy and camera view. Embolization procedures with microcatheter including so-called “plug and push technique” can be simulated with real tactile feelings.



Before

After

3D Imaging

Components



Model for NV



Smart Tank for NV



HEARTROID Pump Type-I

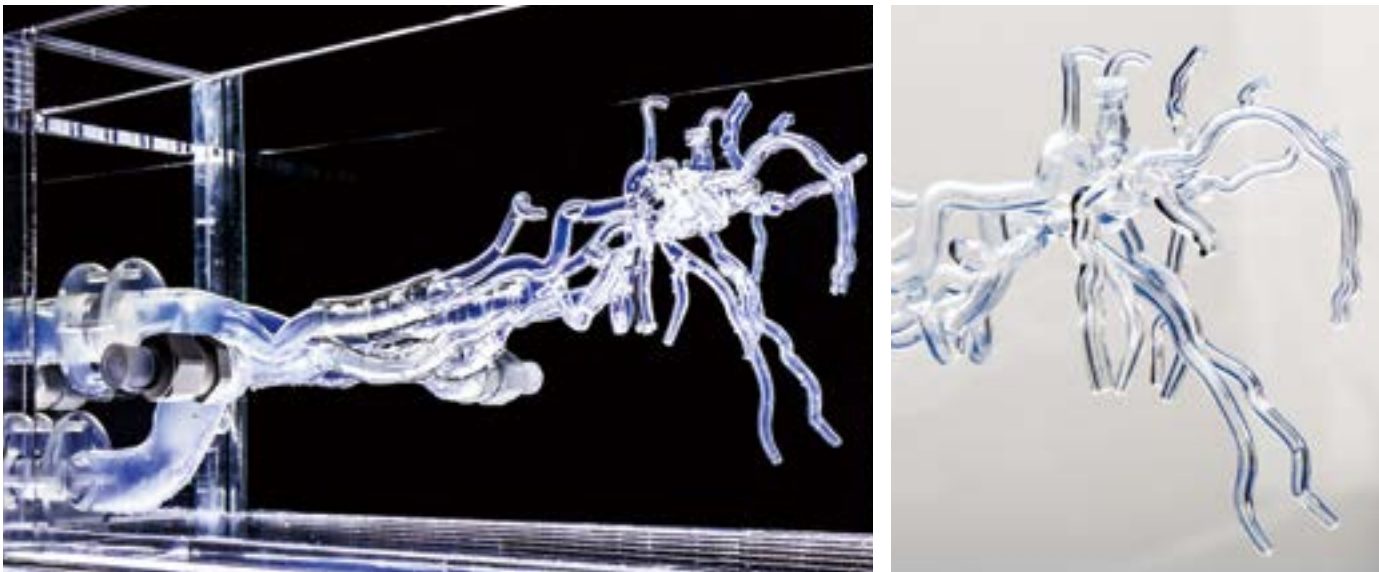


Camera Set



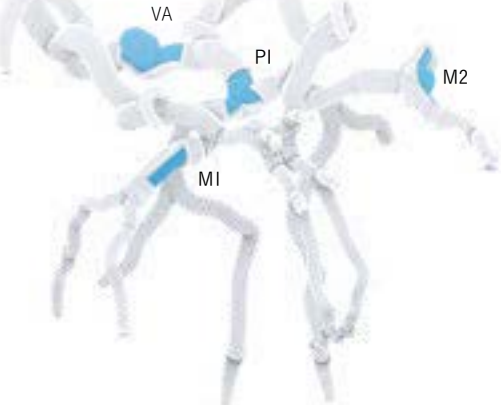
Carry Case

NV Model



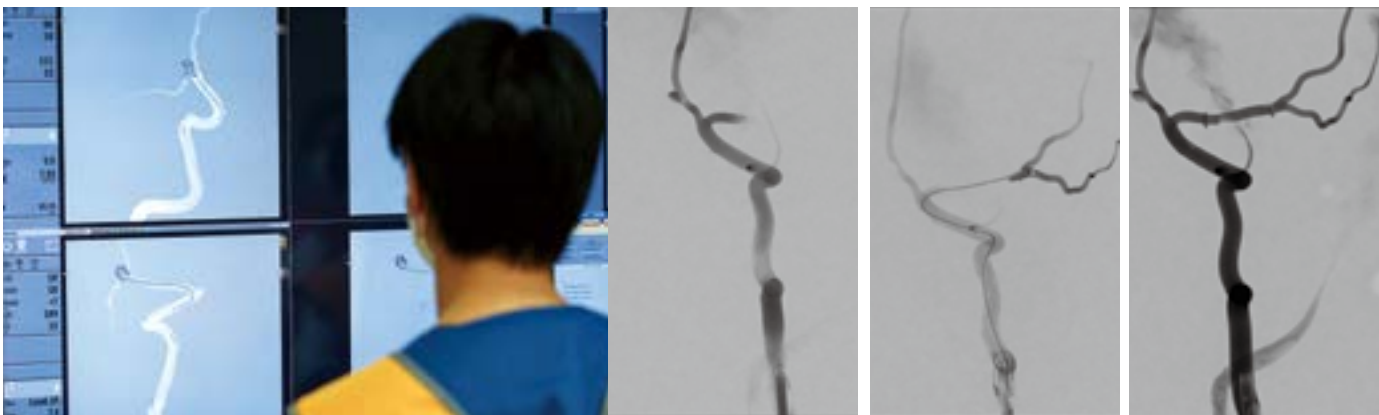
By reproducing blood flow with a dedicated pulsating pump, cerebral angiography can be performed as in actual clinical practice. This transparent vascular model created by using a 3D-printing technology allows us to directly observe the behavior of the devices such as embolic coils for cerebral aneurysms and stent retrievers for thrombus retrieval in stroke cases. The system enables effective simulation training by monitoring both direct visual images and X-ray fluoroscopic images, which cannot be realized in actual clinical practices.

All-in-one catheterization simulator for neurovascular interventional procedures



Lesion parts can realize various scenarios

NV model platform has a pocket for attaching “lesion parts”. Various scenarios for simulation training can be implemented by replacing the “lesion parts” depending on your purpose.



Cerebral angiography can be performed with contrast under X-ray fluoroscopy

Before thrombus retrieval

Successful microcatheter delivery

After thrombus retrieval

Recommended procedures

Coil embolization



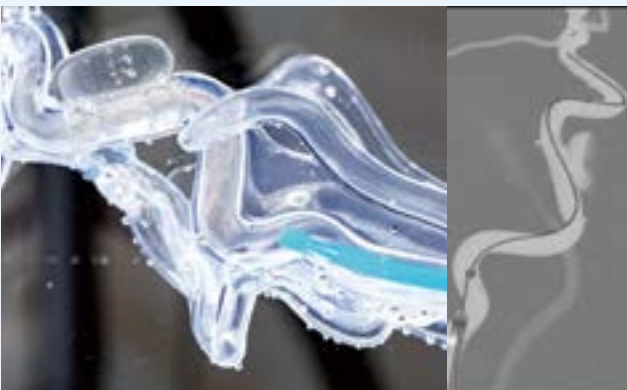
As in actual clinical practices, cerebral angiography in DSA mode can be performed, and using this image as a reference, the catheter can be delivered to the lesion and an embolic coil can be implanted in the aneurysm. This procedure can be repeated over and over again by replacing the aneurysmal lesion parts.

Thrombectomy



As in actual clinical practice, a series of procedures can be performed from delivery of the stent retriever to thrombus retrieval while performing cerebral angiography. The procedure can be repeated by replacing the disposable thrombus lesion parts.

Flow-diverter deployment



A removable aneurysm (φ15 mm) is available for simulation training on the Flow-diverter system, a new treatment method for large cerebral aneurysms. The morphology and the size of aneurysms are customizable.

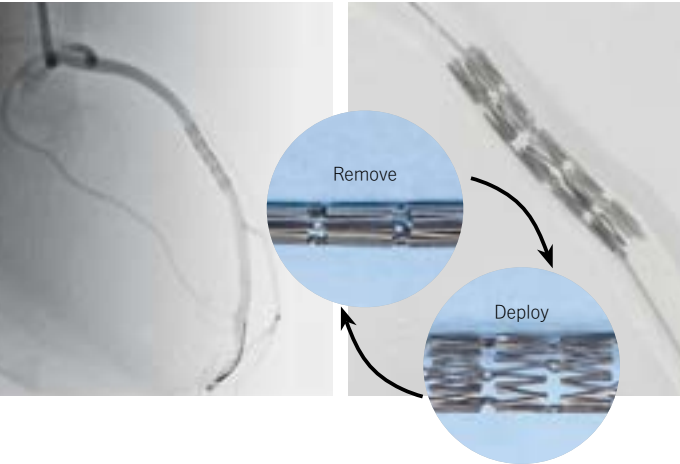
AVM embolization



AVM (arteriovenous malformation) embolization can be facilitated under X-ray fluoroscopy and camera view. Embolization procedures with microcatheter including so-called “plug and push technique” can be simulated with real tactile feelings.

Options and Accessories

Reusable Training Stent (Commercial stents can be used instead)



Used in Heart Coronary Model for PCI training.
Deployed with a balloon catheter as for a real PCI
procedure (not for human use) and easy to remove.



Camera Set



A compact camera with a flexible arm that
can provide clear images from various
angles.
Via the flexible arm, observation from
various angles can be performed. Simple
connection with a camera and monitor, a
clear image can be attained.



Camera with arm : 15×15×30 (mm)
Special attachment : 280 (mm)
Outer size : 195×150×65 (mm)

Sheath Fixture



A portable sheath stabilizer
easy to store in a small
portable case.

ECG Pulse Generator



Pulse generator for
synchronisation with CT and
other modalities.

Heater System



Heater system to maintain the
water temperature in the tank
at a constant temperature
close to the body temperature.

Pressure Monitoring System



System to display the pressure
waveform at the catheter
tip in the situation without a
polygraph.

Special Carry Case



Standard Carry Case

Large carrying case customized for HEARTROID.
Total Outer Size: 730 x 515 x 325mm
Capacity: 96 liters
Capable of containing the components.

Damage Protection Case (M)

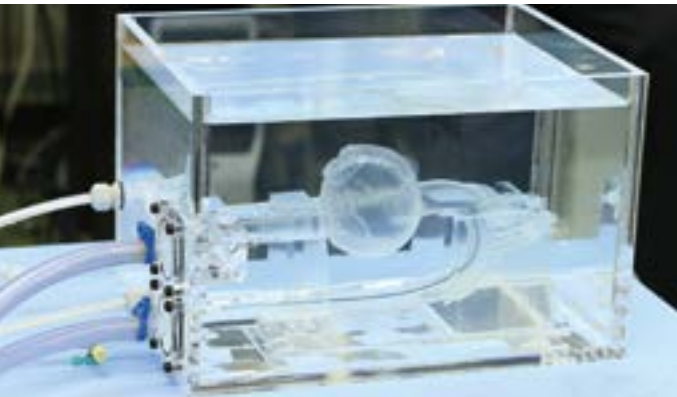
Total Outer Size: 712 x 500 x 337mm
Capable of containing the whole components.
BoxCaseTrunk
Capable of containing the components.

Damage Protection Case (L)

Total Outer Size: 854 x 540 x 380mm
Capable of containing the whole components.
BoxCaseTrunk. Capable of containing the components.
Detachable casters (spare casters include).



HEARTROID for R & D



A high performance pump producing and controlling pulsatile flows and a water tank appropriate for various clinical scenarios and heart models are available. Please contact JMC for price and customization.

Specifications

HEARTROID Model	Coronary					Structure											EP				Peripheral				Heart Failure		NV
	PCI	CTO	BIF	CAG	CABG	TAVI	TAVI CEP Dry	MV	TV	TPVI	LAA  (Hydrogel)	LAA (Silicon)		TSP/ ASD/ PFO  (Hydrogel)	TSP/ ASD /PFO (Silicon)	CSR	EP  (Hydrogel)	EP (Silicon)	CRT	Leadless	EVT	TAA	AAA	RDN	Percu- taneous VAD	EMB	NV
Page	5	6	7-8	6	6	15-20	20	21	22	23	24	24		25-26	25-26	27	29-30	29-30	32	33-34	36	37	38	39	41	42	45-46

Components

Pulsatile Pump	Type-1		●						●							●	●	●	●		●		●	●			●
	Type-2					●				●***												●			●		
	Type-3							●	●		●	●		●	●					●						●	
Smart Tank	—		●			●		●	●	●	●	●		●	●	●	●	●	●	●	●	●	●	●	●	●	●
Hose	—		●			●											●				●				●		●
Sheath	—		●			●	●	●	●	●	●	●		●	●	●	●	●	●	●	●	●	●	●	●	●	●
Lubricant	—		●			●		●	●	●		●		●	●	●		●	●	●	●	●	●	●	●	●	●
Special Parts	—		●			●		●	●					●	●	●				●	●	●			●	●	●
Camera	—		●			●											●				●				●		●
Sheath fixture	—		●			●											●				●				●		●
Carry case *	Standard		●			●											●				●				●		●
	Damage Protection M		●			●		●			●	●			●	●				●	●					●	●
	Damage Protection L					●**			●	●				●			●	●			●	●	●	●	●	●	

 ... Hydrogel series compatible

*...Standard or Damage Protection carryig case can be selected

**...TAVI HZ model

***... TPVI typeS needs type2 pump only
TPVI typeB needs both typeI and type2 pump

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-Joint research and development



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